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NAS WHITING FIELD
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CONTAMINATION ASSESSMENT REPORT SITE 2894 NAS WHITING FIELD FL
9/1/1993
ABB ENVIRONMENTAL

CONTAMINATION ASSESSMENT REPORT

SITE 2894

**NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA**

UIC: N60508

Contract No. N62467-89-D-0317

Prepared by:

**ABB Environmental Services, Inc.
2590 Executive Center Circle, East
Tallahassee, Florida 32301**

Prepared for:

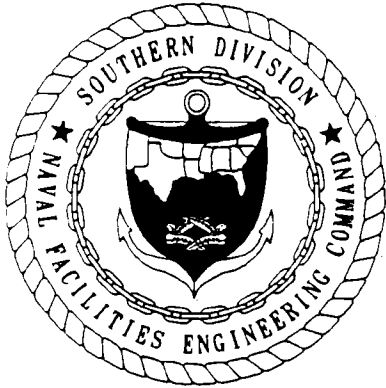
**Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29418**

Luis Vazquez, Code 1843, Engineer-in-Charge

September 1993

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SOUTHNAVFACENGCOM	6
NAS WHITING FIELD	2



FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments (HSWA) of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act (RCRA) of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by the individual States, who were allowed to develop more stringent standards, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations, Title 40, Part 280 (Title 40 CFR 280) (*Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks*) and Title 40 CFR 281 (*Approval of State Underground Storage Tank Programs*). Title 40 CFR 280 was revised and published on September 23, 1988, and became effective December 22, 1988.

The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs. This report was prepared to satisfy the requirements of the Florida Department of Environmental Protection (FDEP), formerly Florida Department of Environmental Regulation (FDER), Chapter 17-770, Florida Administrative Code (FAC) (*State Underground Petroleum Environmental Response*) regulations on petroleum contamination in Florida's environment as a result of petroleum spills or leaking tanks or piping.

Questions regarding this report should be addressed to the Environmental Coordinator, Naval Air Station (NAS) Whiting Field, Milton, Florida, at 904-623-7181, or to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Code 1843, at DSN 563-0613 or 803-743-0613.

EXECUTIVE SUMMARY

ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) at Building 2894, Naval Air Station Whiting Field, Milton, Florida. The CA at Building 2894 site was initiated in response to a directive issued by the Florida Department of Environmental Regulation (FDER), now the Florida Department of Environmental Protection (FDEP).

On 5 April 1991, JP-5 jet fuel was discovered leaking from an underground pipeline between Building 2894 and the truckstand used to offload fuel from trucks to ASTs 2891 and 2892. Base personnel estimated that at least 25 gallons of JP-5 was released into the soil in the vicinity of the pumphouse.

On the day the leak was discovered, approximately 2 cubic yards of fuel-saturated soil was excavated from the vicinity of the release. The underground pipeline was flushed with water, abandoned in place, and replaced with a new aboveground pipeline which is currently in use. The contaminated water used to flush the pipeline was disposed of in the base's water contaminated fuel system and the excavated soil was transported to the Santa Rosa County Landfill for disposal.

The Pensacola office of the FDEP, was notified by base personnel of the release on the afternoon of 5 April 1991. A Discharge Reporting Form, officially notifying the FDEP of the release was submitted 8 April 1991. On 13 June 1991, FDEP notified SOUTHNAVFACENGCOM that it should proceed with a CA of the site as required in Chapter 17-770, Florida Administrative Code (FAC).

Soil borings and monitoring wells were placed at the site during the CA to assess the horizontal and vertical extent of soil and groundwater contamination. Soil and groundwater samples were collected and analyzed in accordance with Chapter 17-770, FAC. The findings, conclusions, and recommendations of the Contamination Assessment Report (CAR) are summarized below.

Findings

- Sediments encountered during drilling operations at the site consist of layers of very fine-to coarse-grained quartz sand, clayey sand, and sandy clay. An intermittent lens of clay causes perched water conditions about 15 to 20 feet below land surface (bls) and at 90^{ft} bls.
- There are two distinct waterbearing zones at the site separated by a clay layer approximately 15 feet thick. Groundwater in the upper waterbearing zone is encountered at depths ranging from 72.58 feet bls to 85.91 feet bls, or surface elevations from 80.39 feet to 83.31 feet above NGVD. Groundwater in the lower waterbearing zone is encountered from approximately 94.58 feet bls to 96.9 feet bls. The clay layer forms an aquitard for the lower waterbearing zone, which is under pressure and has a potentiometric surface elevation ranging from 69.71 feet to 70.75 feet above NGVD.
- The net groundwater flow direction of the upper waterbearing zone at the site is toward the northeast.

- Organic vapor analyzer (OVA) headspace analysis of soil boring samples indicate the presence of excessively contaminated soil at the site. Excessively contaminated soils extend to a depth of 55 feet bls. The majority of excessively contaminated soil at the site is encountered from ground surface to depths ranging from 25 to 30 feet bls.
- Laboratory results of groundwater samples indicate concentrations of kerosene analytical group compounds were either less than method detection limits, or detected in concentrations less than State target levels in all wells at the site except WHF-2894-3. In monitoring well WHF-2894-3 EDB was most recently detected at .06 $\mu\text{g}/\ell$ which is above the State target level of .02 $\mu\text{g}/\ell$.

Conclusions

- Past releases of petroleum products from fueling operations at Site 2894 have resulted in excessive soil contamination as defined in Chapter 17-770, FAC.
- There is no significant groundwater contamination associated with the petroleum release or the excessively contaminated soils.

Recommendations

Based on the findings and conclusions of this CA, a Remedial Action Plan (RAP) is recommended to clean up excessively contaminated soil at Site 2894. Before preparing a RAP a feasibility study should be completed to determine the viability of different remedial technologies.

EXECUTIVE SUMMARY

FIGURE

Needs:

~~Soil Borings~~

Monitoring Wells

Area excavated

Area affected

(identical to revised 5-15 Groundwater
Analytical Results map.

ACKNOWLEDGMENTS

In preparing this report, the Underground Storage Tank Section of the Comprehensive Long-Term Environmental Action, Navy (CLEAN) Group at ABB Environmental Services, Inc. (ABB-ES), commends the support, assistance, and cooperation provided by the personnel of the Naval Air Station (NAS) Whiting Field, Milton, Florida, and Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM).

TABLE OF CONTENTS

Contamination Assessment Report
Site 2894, Naval Air Station Whiting Field
Milton, Florida

<u>Section</u>	<u>Title</u>	<u>Page No.</u>
1.0	INTRODUCTION	1-1
2.0	SITE LOCATION AND BACKGROUND	2-1
2.1	SITE LOCATION AND AREA OF INVESTIGATION	2-1
2.1.1	Relation of Site to Surrounding Area	2-1
2.1.2	Land Use	2-1
2.1.3	Site Layout	2-1
2.2	SITE HISTORY AND OPERATIONS	2-1
2.2.1	Past and Present Use of Site	2-1
2.2.2	Structural Integrity	2-5
2.2.2.1	Inventory Reconciliation	2-5
2.2.2.2	Repairs, Replacements, Removals and Abandonments	2-5
2.2.2.3	Tightness Testing	2-5
2.2.3	Initial Remedial Action (IRA)	2-5
2.3	PREVIOUS INVESTIGATIONS AND OTHER POSSIBLE SOURCES OF CONTAMINATION	2-5
3.0	SITE CONDITIONS	3-1
3.1	PHYSIOGRAPHY	3-1
3.2	GEOLOGY	3-1
3.2.1	Regional Geology	3-1
3.2.2	Site Geology	3-3
3.3	HYDROGEOLOGY	3-3
3.3.1	Regional Hydrogeology	3-3
3.3.2	Site Hydrogeology	3-8
3.3.2.1	Capacity and Continuity of Confining Layers	3-8
3.3.2.2	Aquifer Classification	3-9
3.3	WELL SURVEY	3-9
3.3.1	Private Wells	3-9
3.3.2	Public Wells	3-9
4.0	METHODOLOGIES AND EQUIPMENT	4-1
4.1	SOIL BORING PROGRAM	4-1
4.2	MONITORING WELL PROGRAM	4-1
4.3	GROUNDWATER ELEVATIONS	4-4
4.4	GROUNDWATER SAMPLING PROGRAM	4-4
5.0	CONTAMINATION ASSESSMENT RESULTS	5-1
5.1	AQUIFER CHARACTERISTICS	5-1
5.1.1	Piezometer Surface	5-1
5.1.2	Horizontal Groundwater Flow Velocity	5-1
5.2	CONTAMINANT PLUME DEFINITION AND CHARACTERIZATION	5-8
5.2.1	Quality Assurance Project Plan	5-8
5.2.2	Soil Assessment	5-8
5.3.3	Groundwater Assessment	5-8

TABLE OF CONTENTS (Continued)

Contamination Assessment Report
Site 2894, Naval Air Station Whiting Field
Milton, Florida

<u>Section</u>	<u>Title</u>	<u>Page No.</u>
6.0	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	6-1
6.1	SUMMARY	6-1
6.2	CONCLUSIONS	6-2
6.3	RECOMMENDATIONS	6-2
7.0	PROFESSIONAL REVIEW CERTIFICATION	7-1

REFERENCES

APPENDICES

- Appendix A: Release and Initial Remedial Action Documentation
- Appendix B: Lithologic and Monitoring Well Completion Logs
- Appendix C: Aquifer Parameter Calculations and Slug Test Data
- Appendix D: Analytical Results

LIST OF FIGURES

Contamination Assessment Report
Site 2894, Naval Air Station Whiting Field
Milton, Florida

<u>Figure</u>	<u>Title</u>	<u>Page No.</u>
2-1		2-2
2-2		2-3
2-3		2-4
2-4		2-6
2-5		2-7
3-1		3-2
3-2		3-4
3-3		3-5
3-4		3-6
3-5		3-7
3-6		3-10
4-1		4-2
4-2		4-3
4-3		4-5
4-4		4-6
5-1		5-3
5-2		5-4
5-3		5-5
5-4		5-6
5-5		5-9
5-6		5-10
5-7		5-11
5-8		5-12
5-9		5-13
5-10		5-14
5-11		5-19
5-12		5-20
5-13		5-21
5-14		5-22
5-15		5-23

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page No.</u>
3-1	Production Rates for NAS Whiting Field Supply Wells	3-11
5-1	Top of Casing and Groundwater Elevations	5-2
5-2	Estimated Hydraulic Conductivities Evaluated Using Aqtesolv	5-7
5-3	Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analytical Data, February 1991 through July 1993	5-15

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
AST	aboveground storage tank
BGL	below groundwater level
bls	below land surface
BTEX	benzene, toluene, ethyl benzene, and xylenes
CA	contamination assessment
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CompQAP	Comprehensive Quality Assurance Plan
CTO	Contract Task Order
EDB	ethylene dibromide
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FID	flame ionization detector
ft/day	feet per day
ft/ft	feet per foot
GC	gas chromatograph
gpm	gallons per minute
HRS	Hazard Ranking System
IR	Installation Restoration
K	hydraulic conductivity
mg/l	milligrams per liter
MOP	Monitoring Only Proposal
msl	mean sea level
MTBE	methyl tert-butyl ether
µg/l	micrograms per liter
NAS	Naval Air Station
NEESA	Naval Energy and Environmental Support Activity
NFAP	No Further Action Proposal
NGVD	National Geodetic Vertical Datum
OVA	organic vapor analyzer
PCA	Preliminary Contamination Assessment
PCAR	Preliminary Contamination Assessment Report
PCE	tetrachloroethene
POA	Plan of Action
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride

GLOSSARY (Continued)

SOUTHNAV-	
FACENGCOM	Southern Division, Naval Facilities Engineering Command
SPCC	Spill Prevention Control and Countermeasure
SPT	standard penetration test
TCE	trichloroethene
TRAWING	Training Air Wing Five
FIVE	
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
V	velocity
VOC	volatile organic compounds

1.0 INTRODUCTION

On 5 April 1991, JP-5 jet fuel was discovered leaking from an underground pipeline between Building 2894 and the truckstand used to offload fuel from trucks to ASTs 2891 and 2892. Base personnel estimated that at least 25 gallons of JP-5 was released into the soil in the vicinity of the pumphouse.

ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) and submit a Contamination Assessment Report (CAR) for each of six petroleum contaminated sites at Naval Air Station (NAS) Whiting Field. This CAR is submitted for one of the sites, Site 2894.

The scope of services for the work at ^{NAS Whiting Field} ~~Site 2894~~ is described in Contract Task Order (CTO) No. 009, the Plan of Action (POA), and the Contamination Assessment Plan (CAP) and included the following:

- drilling of soil borings and analyzing site soils to assess the degree and the extent of soil contamination,
- installing and sampling groundwater monitoring wells to assess the degree and the extent of groundwater contamination,
- collecting water level data to estimate the groundwater flow direction and hydraulic gradient at the site,

- conducting a potable well inventory within a 0.50-mile radius of the site,
- conducting slug tests on selected wells to estimate aquifer characteristics, and
- reducing and analyzing pertinent data gathered during the CA to complete this CAR.

The CA at Site 2894 was conducted from February through August, 1992, and May through July 1993. The following sections of the report present the background information, data compilation, results, conclusions, and recommendations of the CAR.

2.0 SITE LOCATION AND BACKGROUND

2.1 SITE LOCATION AND AREA OF INVESTIGATION.

2.1.1 Relation of Site to Surrounding Area NAS Whiting Field is in Florida's northwest coastal area approximately 7 miles north of Milton and 20 miles northeast of Pensacola (Figure 2-1). NAS Whiting Field occupies 3,490 acres in north-central Santa Rosa County with easement rights to an additional 457 acres.

2.1.2 Land Use The station is the home base of Training Air Wing Five (TRAWING FIVE), whose mission is to administer, coordinate, and supervise flight and academic training. The station is divided into a North Field, where fixed wing training takes place, and a South Field used for helicopter training. Support facilities are located between the two fields (Figure 2-2).

2.1.3 Site Layout Building 2894 is a pumphouse used to transfer jet fuel, JP-5, from tanker trucks to aboveground storage tanks (AST) 2891 and 2892. Building 2894 is located in the northeast section of the industrial area at NAS Whiting Field east of ASTs 2891 and 2892. The site topography is generally flat in the area of the truckstand and Building 2894, however, there is a relatively steep hillside north and east of the truckstand area which is terminated by concrete drainage ditches at the base of the hill. West of Building 2894, the ground slopes gently toward the concrete spill containment area surrounding ASTs 2891 and 2892.

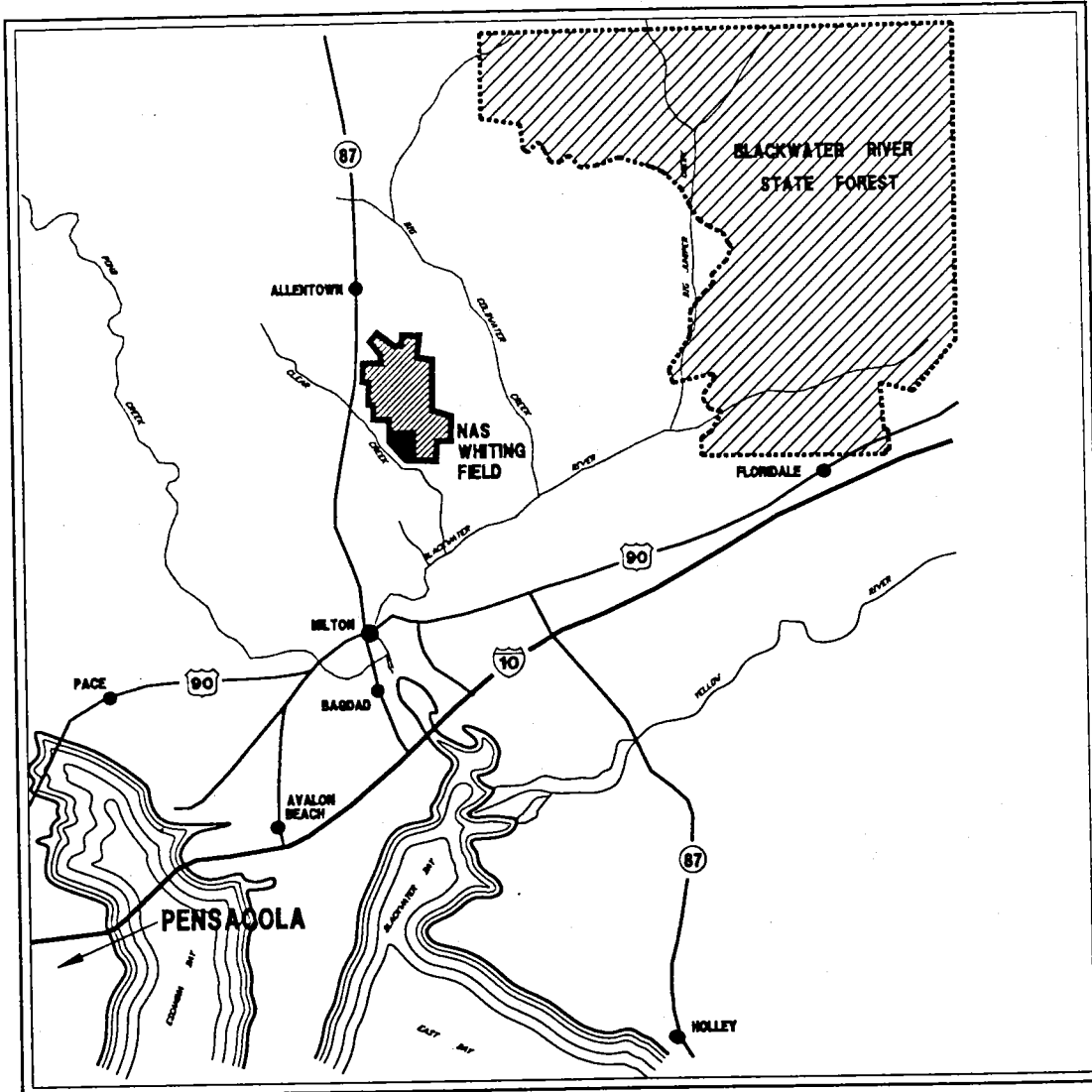
The site consists of Building 2894, which is a one-story, cement block building built on a concrete slab; a concrete truckstand with a spill containment system adjacent to the pumphouse; ASTs 2891 and 2892; and the associated piping.

A site plan of the Building 2894 pumphouse, truckstand, ASTs 2891 and 2892, and surrounding area is presented in Figure 2-3, Site Plan. Also shown in Figure 2-3 are known existing utilities, and the location of the former railroad service line.

2.2 SITE HISTORY AND OPERATIONS.

2.2.1 Past and Present Use of Site In the past, jet fuel was transported to the pumphouse by railcar on a railroad line which ran along the east side of the truckstand. Jet fuel was offloaded from the railcars via a pipeline adjacent to the railroad line and pumped into ASTs 2891 and 2892. The railroad line was removed in the mid-1970's and the associated pipelines were abandoned in place. Today, JP-5 is transferred from tanker trucks to ASTs 2891 and 2892 through the Building 2894 pumping station. Jet fuel, JP-5, has been stored at this site since the 1960's.

Tanks 2891 and 2892 are two 230,000 gallon steel ASTs that were constructed in 1961. The tanks have secondary spill containment consisting of a concrete base and berm. The spill containment area is surrounded by chain-link fencing and locking gates to discourage unwarranted entry. The truckstand is also bermed and has drains that flow into the AST spill containment area in the event of a release.



SITE MAP



MAP LOCATION

0 2.5 5 MILES
SCALE: 1" = 5 MILES

Source: ABB Environmental Services Inc., 1992

**FIGURE 2-1
FACILITY LOCATION MAP**



SITE 2894

**NAS WHITING FIELD
MILTON, FLORIDA**

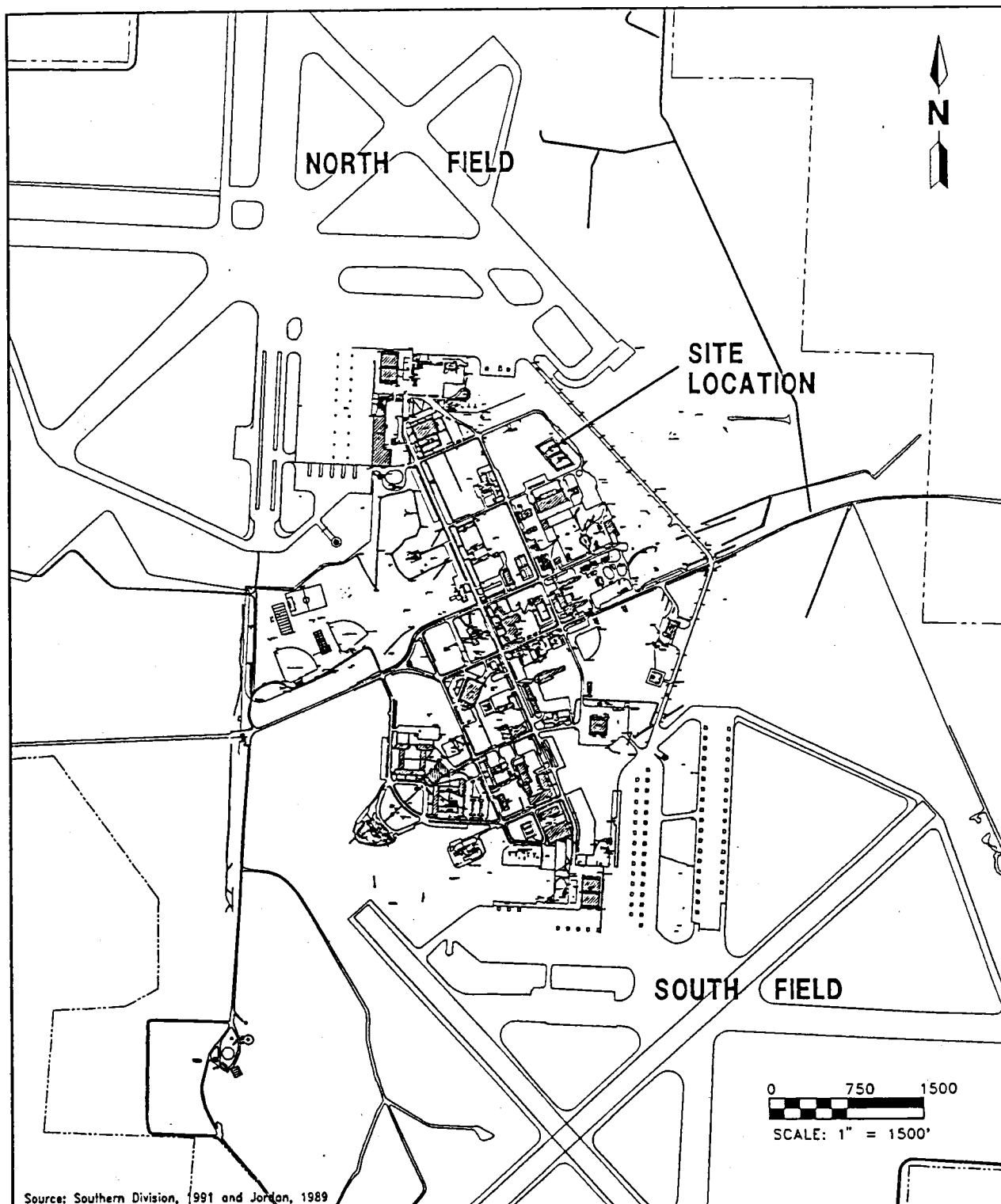
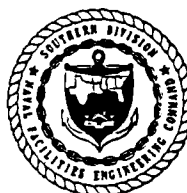
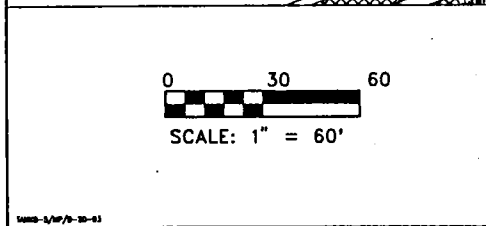
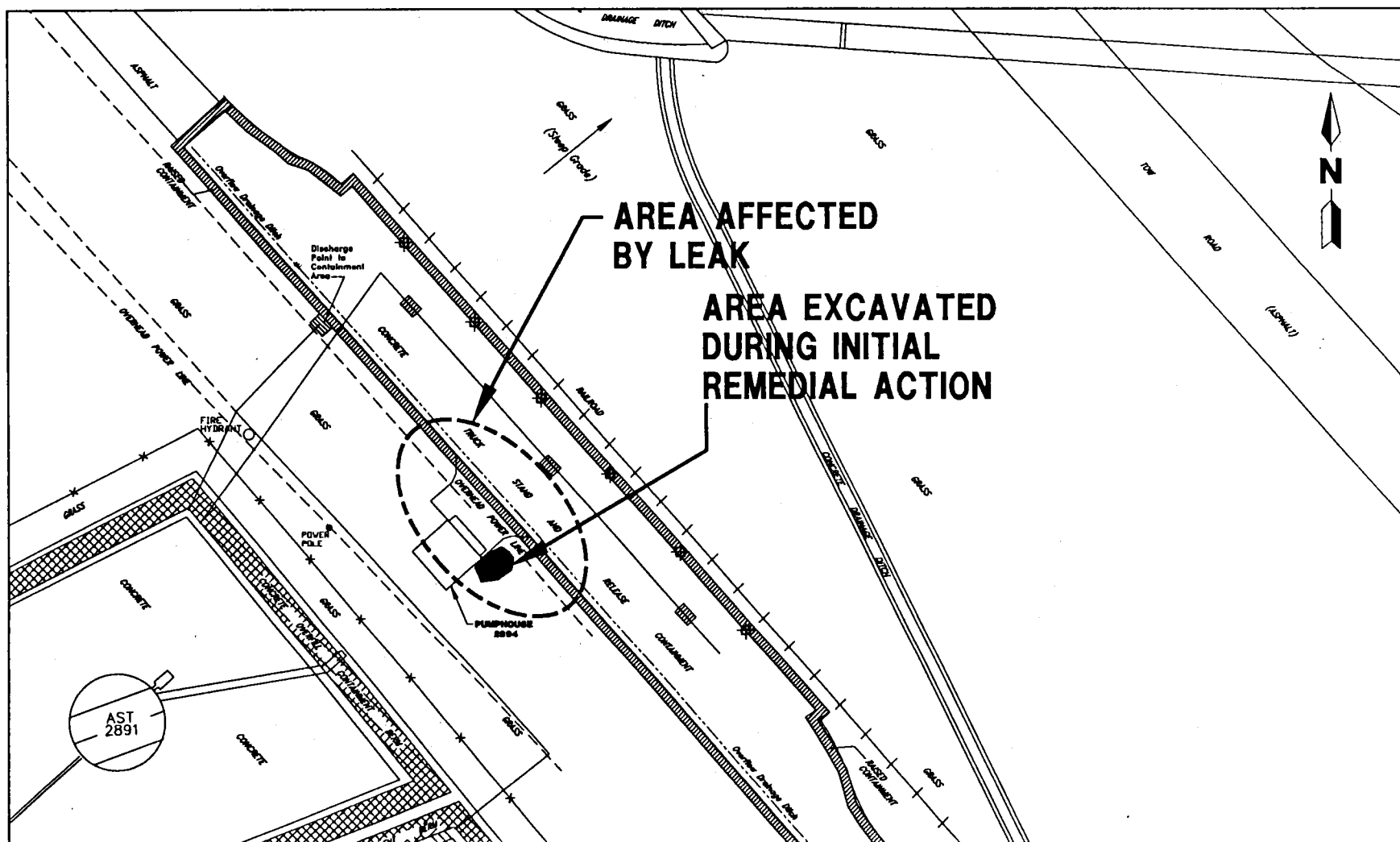


FIGURE 2-2
SITE LOCATION MAP



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA

On 5 April 1991, JP-5 jet fuel was discovered leaking from an underground pipeline between Building 2894 and the truckstand used to offload fuel from trucks to ASTs 2891 and 2892. Base personnel estimated that at least 25 gallons of JP-5 was released into the soil in the vicinity of the pumphouse (Figure 2-3).

The Pensacola office of the FDEP, was notified of the release on the afternoon of 5 April 1991. A Discharge Reporting Form, officially notifying the FDEP of the release was submitted 8 April 1991. On 13 June 1991, FDEP notified SOUTHNAVFACENGCOM that it should proceed with a CA of the site as required in Chapter 17-770, Florida Administrative Code (FAC).

2.2.2 Structural Integrity

2.2.2.1 **Inventory Reconciliation** Tanks 2891 and 2892 are inventoried daily and are contained in the base Spill Prevention Control and Countermeasure (SPCC) plan.

2.2.2.2 **Repairs, Replacements, Removals and Abandonments** In the mid-1970's, when the railroad was taken out of service, the fuel fill ports located along the northeast side of the truckstand were abandoned by draining the lines and filling the ports with cement.

2.2.2.3 **Tightness Testing** The piping connecting the pumphouse to the dispensers located approximately 0.5-miles to the west is scheduled for tightness testing in 1994. No testing of these components has previously been performed at this site (Figure 2-4).

2.2.3 Initial Remedial Action (IRA) On the day the leak was discovered, approximately 2 cubic yards of fuel-saturated soil was excavated from the vicinity of the release (Figure 2-3). The underground pipeline was flushed with water, abandoned in place, and replaced with a new aboveground pipeline which is currently in use. The contaminated water used to flush the pipeline was disposed of according to base procedures for water- contaminated fuel. The excavated soil was transported to the Santa Rosa County Landfill for disposal.

The horizontal and vertical extent of petroleum-contaminated soil excavated at the site was based on visual inspection of the soil. No organic vapor analysis was performed to screen the soil during the excavation to assess the level or extent of petroleum-contaminated soil at the site.

All available documentation associated with the JP-5 release and initial remedial action are attached as Appendix A, Release and Initial Remedial Action Documentation.

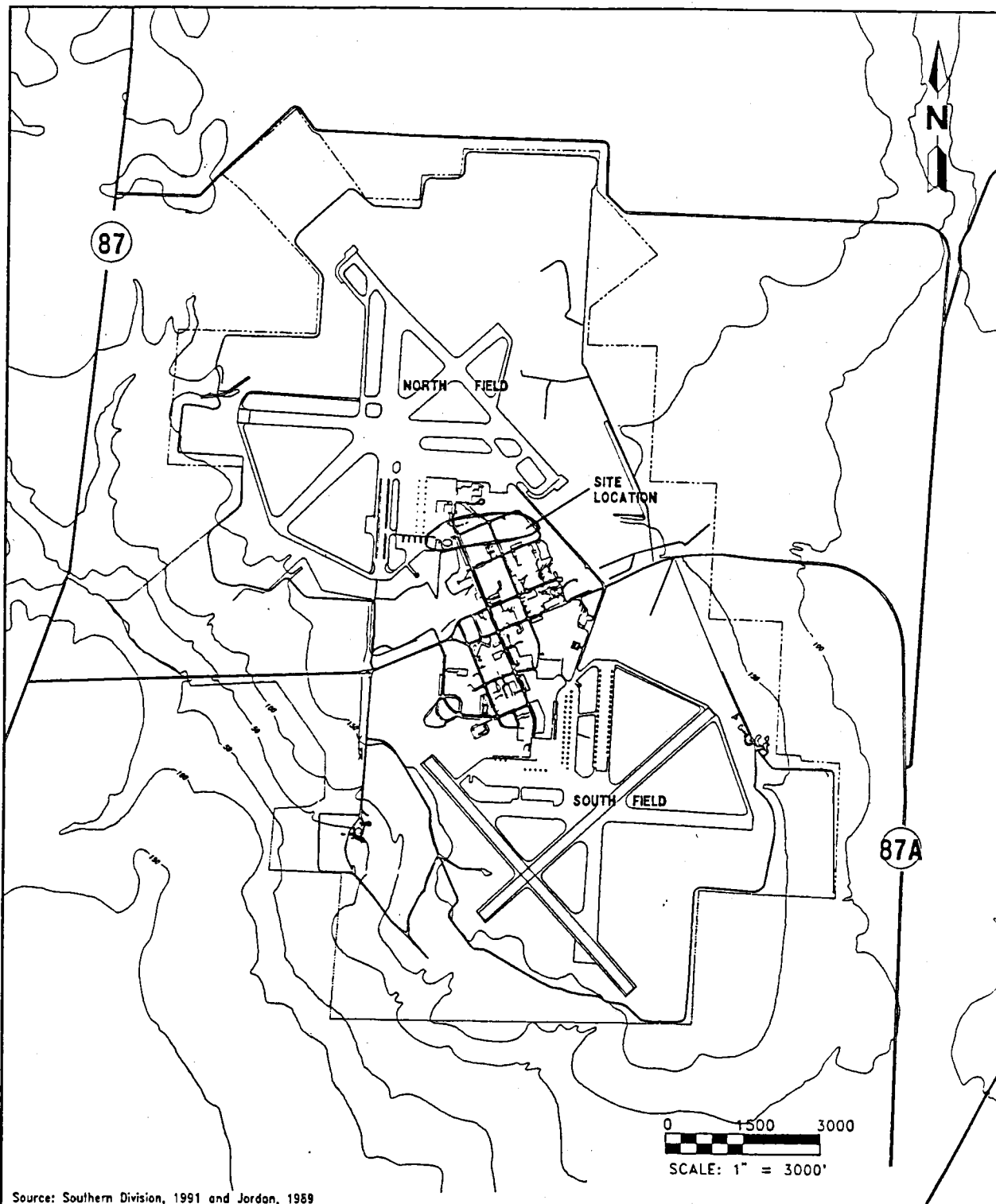
2.3 PREVIOUS INVESTIGATIONS AND OTHER POSSIBLE SOURCES OF CONTAMINATION. Other possible sources of petroleum contamination on the facility include the former underground storage tanks at the North and South Fuel Farms, the abandoned fuel hydrant system on the North and South Field, the Navy Exchange Service Station, the waste oil tanks near the North Field Maintenance Hangar, the USTs located at the power plant and Building 1470, and the Aboveground Storage Tank 2891 (Figure 2-5). All of these sites are currently being investigated under Chapter 17-770 FAC or in IR program.

FIGURE 2-4

Dispensers

~~show site~~ show site and dispensers (near IR site 3)
and distance between

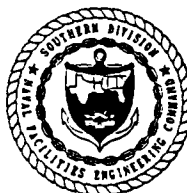
Dispersals



Source: Southern Division, 1991 and Jordan, 1989

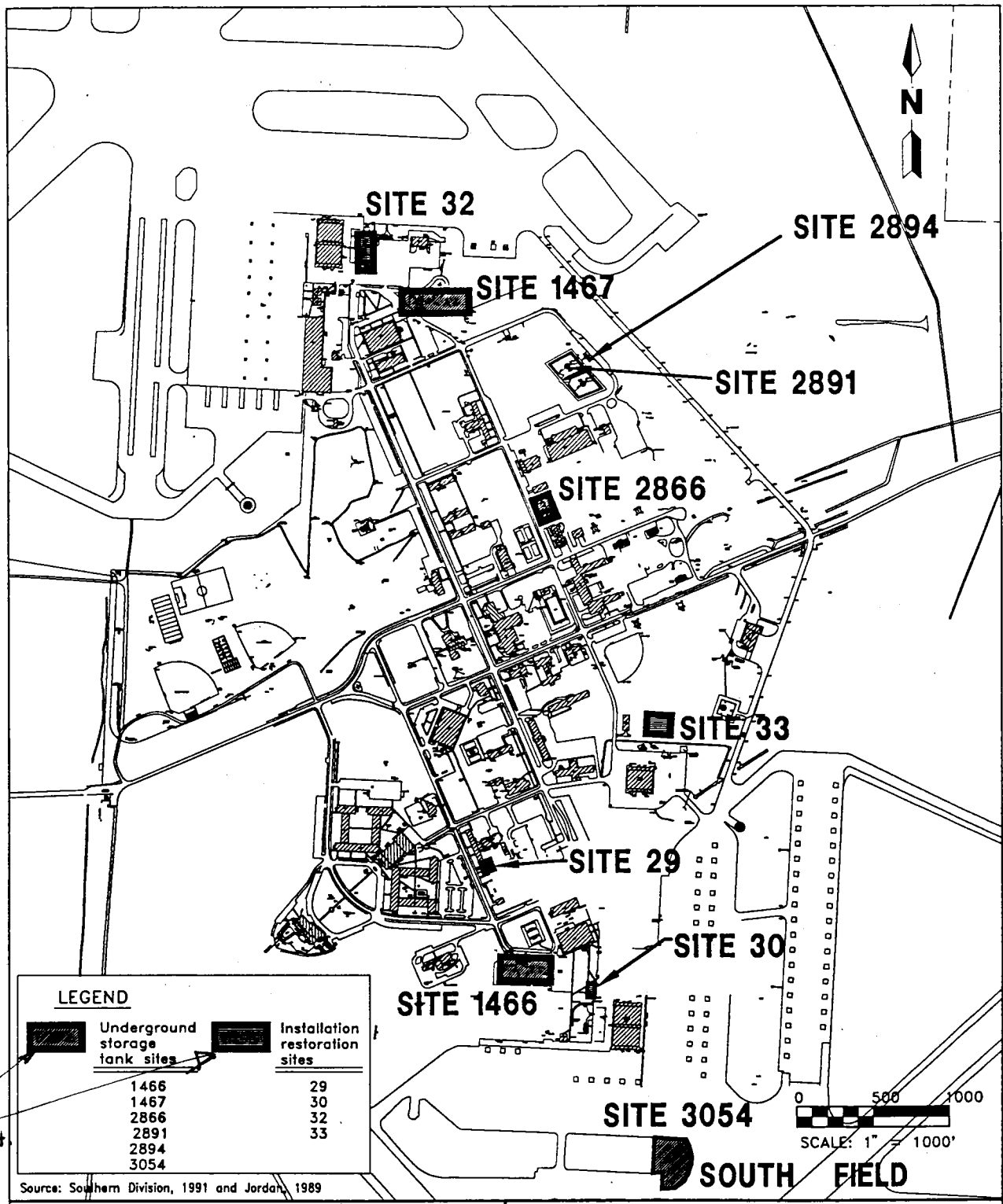
FIGURE 1-2 2-1
NAS WHITING FIELD

2A



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA



**FIGURE 2-5
SITE LOCATION MAP**



SITE 2894

**NAS WHITING FIELD
MILTON, FLORIDA**

There have been no previous investigations conducted at the Building 2894 site, however, there are six sites at NAS Whiting Field currently under investigation in accordance with Chapter 17-770 FAC with several others scheduled in the future. The sites in the vicinity of Site 2894 are shown in Figure 2-5. These sites are discussed below.

Site 1467, the North Fuel Farm, is currently under investigation. Due to possible mixed contaminant plumes, sampling is scheduled to begin in late August to determine if this site should continue to be assessed under Chapter 17-770 FAC.

Site 2866, the Navy Exchange Service Station, CA and CAR are complete. Approval by FDEP of the recommended NFAP is pending the results of the tank removal scheduled for the upcoming year.

Site 2891 is the aboveground storage tank, adjacent to Site 2894, which was investigated under 17-770 FAC due to a release that occurred on 6 August 1991. The CAR submitted for this site in January 1993 recommended a No Further Action Proposal (NFAP). Approval of the CAR is pending confirmatory soil sampling and subsequent FDEP review.

NAS Whiting Field is also undergoing investigation as a component of the Navy Installation Restoration (IR) program. The IR program has been designed to identify, prioritize, and abate or control contaminant migration resulting from past operations at Naval Installations. There are currently 23 sites being investigated under this program at NAS Whiting Field. Due to the proximity of

the IR program sites to Site 2894, data from the IR investigation pertinent to this site are referenced in this report.

3.0 SITE CONDITIONS

3.1 PHYSIOGRAPHY. NAS Whiting Field is located within the Western Highlands subdivision of the Northern Highlands. This zone is characterized by southward sloping hills and plateaus, which have been cut by numerous streams. Elevations generally range from 50 to 200 feet above mean sea level (msl). Site elevations range from 150 feet to 190 feet msl. Surface water runoff is conveyed to Clear Creek (west and south) and Big Cold Creek (east) by a system of ditches and storm drains. The drainage system was installed when the base was constructed in the early 1940's.

3.2 GEOLOGY.

3.2.1 Regional Geology NAS Whiting Field is underlain by a thick sequence of Tertiary sedimentary formations. A generalized geologic column of these formations is presented in Figure 3-1. The regional geologic characterization presented in this section has been taken from the RI Workplan, Volume I (Jordan, 1990), the Verification Study (Geraghty and Miller, 1986), the Initial Assessment Study (Envirodyne Engineers, 1985), and Marsh, (1966).

The oldest formation studied in the panhandle area (Escambia and Santa Rosa Counties) is the Hatchetigbee Formation of the early Eocene series. This formation is composed of silty clay with beds of glauconitic shale and shaly limestone. The average thickness of the Hatchetigbee Formation is 315 feet (Marsh, 1966).

Overlying the Hatchetigbee is the Tallahatta Formation of middle Eocene, which consists of shale and siltstone deposits interbedded with gray limestone and well sorted sand.

Above the Tallahatta is the Lisbon equivalent that has been correlated with the Lisbon Formation of Alabama. The Lisbon is approximately 500 feet thick and consists of a shaly limestone.

The upper Eocene series is represented by the Ocala group. The Ocala is a light-gray limestone and averages 165 feet in thickness. Fifty-seven species of Fomarinifera were identified in this group. Unconformably overlying the Ocala is the Bucatunna Clay Member of the Byram Formation. The Bucatunna is a dark gray soft clay averaging 125 feet in thickness throughout the western Florida Panhandle.

The Chickasawhay Limestone and Tampa Formation are so similar in the western Panhandle that they are presented as undifferentiated on the geologic column. The Chickasawhay is a gray dolomitic limestone and the Tampa is a light gray to white hard limestone (generally not dolomitic). These undifferentiated sediments range in thickness from 30 to 270 feet.

Above the Chickasawhay-Tampa Formation lies the Pensacola clay which consists of an upper and lower member of dark to light gray sandy clay. These two members are separated by the Escambia sand member of gray fine to coarse sand. The upper member of the Pensacola clay is not present in the immediate vicinity of NAS

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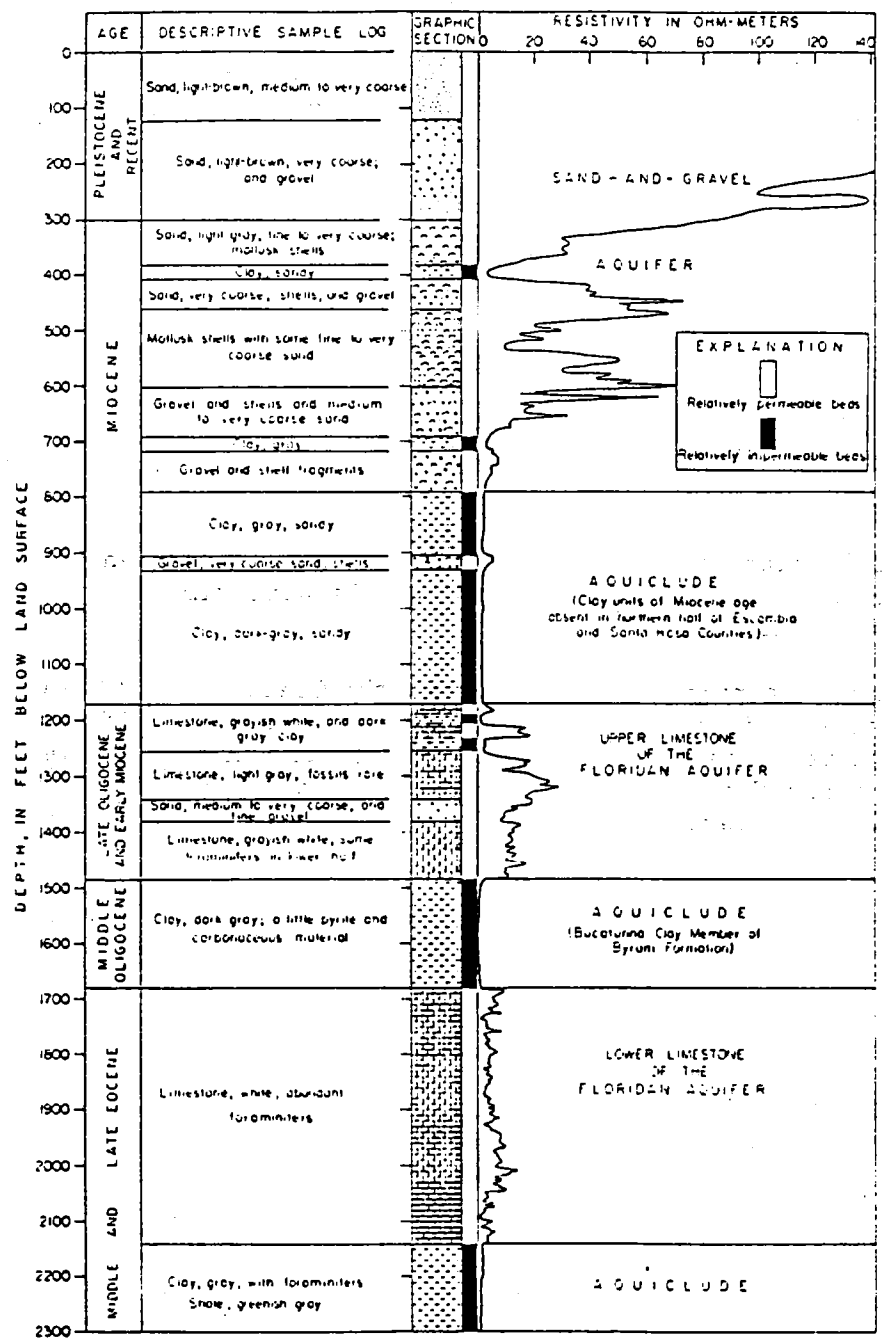


FIGURE 3-1

Generalized Hydrogeological
Section of Santa Rosa County



Change:
RI/FS PROGRAM

NAS WHITING FIELD
MILTON, FLORIDA

Sheet

Whiting Field and the lower member pinches out east of Big Coldwater Creek and is also not below NAS Whiting Field.

Miocene coarse clastics, however, are present throughout the western Florida Panhandle. These coarse clastics are described as brown to gray, poorly sorted sand and gravel with thick lenses of clay. These sediments overlie the Chickasawhay Limestone in the vicinity of NAS Whiting Field.

The Citronelle Formation of Pleistocene age overlies the Miocene clastics and is very similar in composition. The two units are differentiated by the abundance of shells in the Miocene clastics. The thickness of the Citronelle ranges from 40 to 800 feet in westernmost Florida. The Citronelle also contains layers of fossil wood, hardpan, shells, and kaolinitic burrows of aquatic animals (Marsh, 1966).

Three marine shorelines can be recognized from existing topographic profiles across Escambia and Santa Rosa Counties. The shoreline at 30 feet above National Geodetic Vertical Datum (NGVD) of 1929 is represented by the Pimlico terrace, the Penholoway terrace has a relic shoreline at 70 feet NVGD, and the third shoreline is a seaward-sloping upland surface ranging from 70 to 270 feet above NVGD.

The geologic structure of the western Florida Panhandle is a simple homocline with a few faults and folds present in northern Santa Rosa County where the Pollard graben is located.

3.2.2 Site Geology The upper waterbearing zone and the main producing zone of the Sand-and-Gravel aquifer at NAS Whiting Field are classified and regulated as a Class G-II water source according to Chapter 17-3, FAC.

The uppermost surficial sediments at Site 2894 consist primarily of low-permeability sediments such as clayey sand and sandy clay. These sediments range in thickness from approximately 20 to 40 feet. Beneath the low-permeability sediments the lithology generally consists of very fine- to very coarse-grained sands with randomly interbedded lenses and layers of gravel and clay.

Sediments encountered during drilling operations at the site consist of layers of very fine-to coarse-grained quartz sand, clayey sand, and sandy clay. An intermittent lens of clay approximately 5 feet thick approximately 15 to 20 bls causes perched water conditions at the site. Another clay layer, which is more locally extensive, is approximately 15 feet thick and encountered from approximately 90 feet to 105 feet bls.

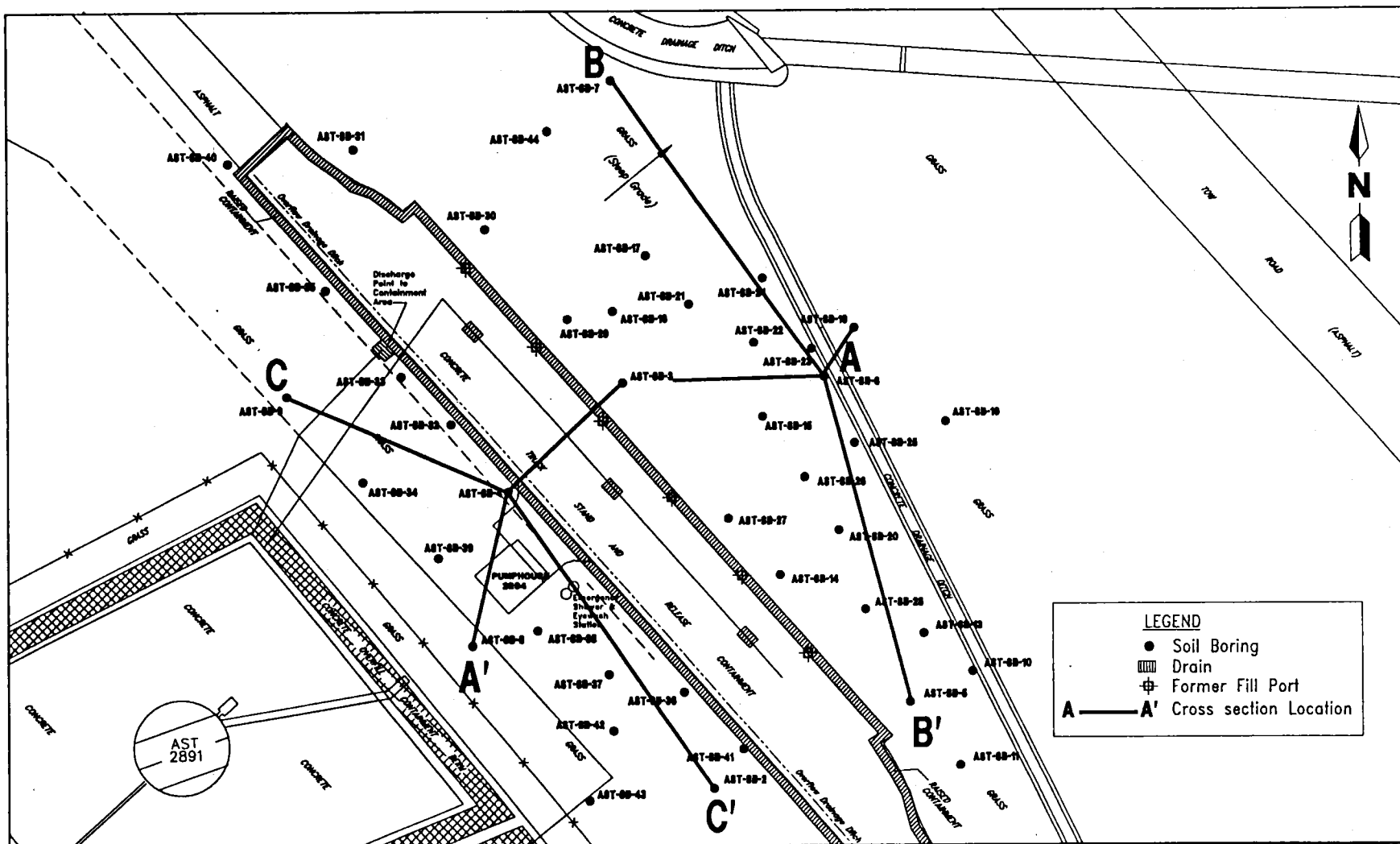
Three cross sections representing the general lithology of the site are presented in Figures 3-2 through 3-5. Complete lithologic logs for all site soil borings and monitoring wells are presented in Appendix B.

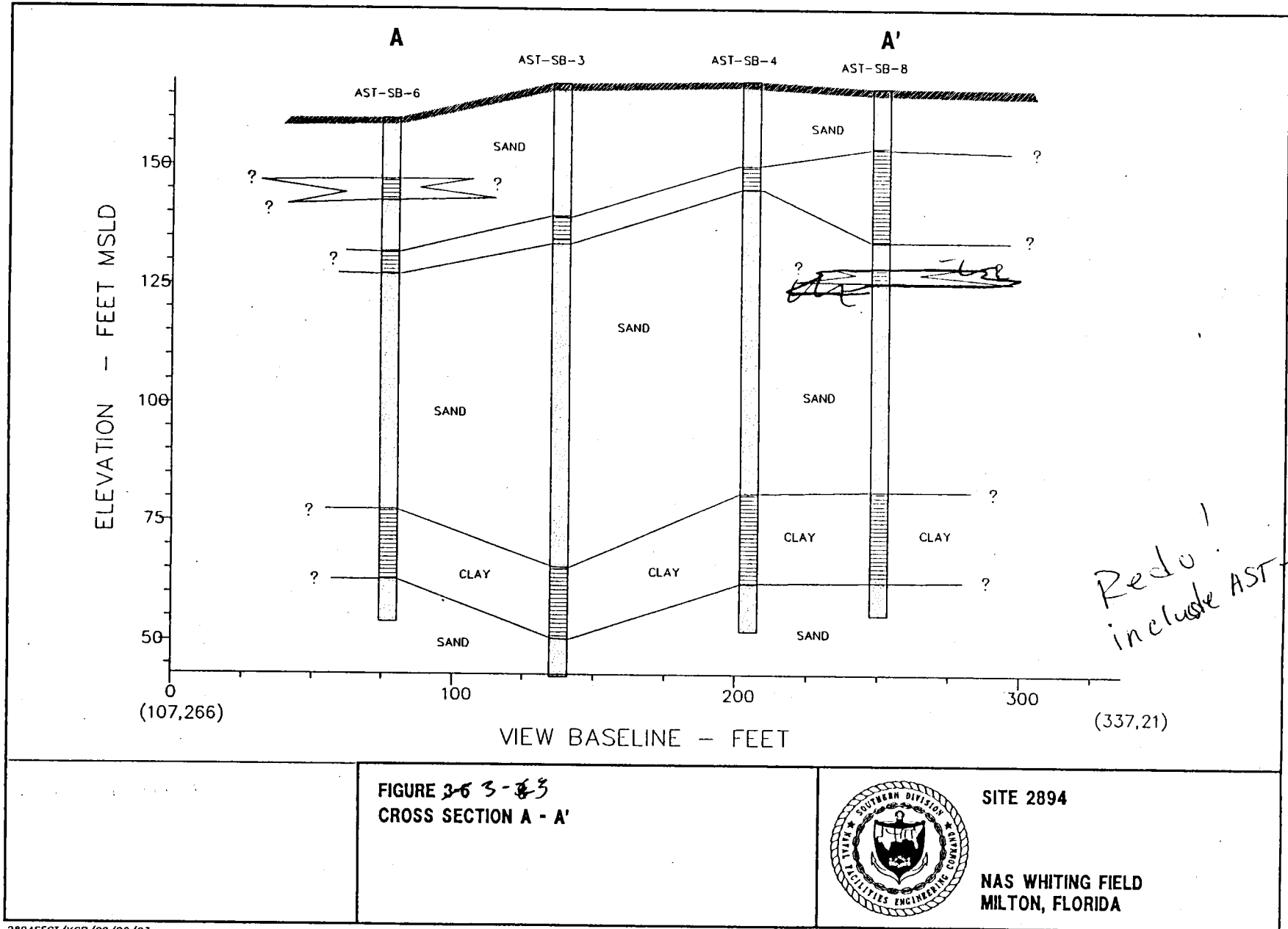
3.3 HYDROGEOLOGY.

3.3.1 Regional Hydrogeology

Sand-and-Gravel Aquifer. The uppermost sediments, extending to a depth of approximately 350 feet below land surface (bls), comprise the sand-and-gravel

aquifer, which is subdivided into two units. The water table or upper part of the sand-and-gravel aquifer does not constitute a source for large water





Dash lines where inferred instead of ??
add legend to explain --- lines

supplies; however, its primary importance is to recharge the lower, more productive zone of the aquifer.

The sand-and-gravel aquifer includes the upper Miocene coarse clastics, the Citronelle Formation, and marine terrace deposits. These three units have similar hydraulic properties and are sometimes indistinguishable. The aquifer consists of poorly sorted, fine- to coarse-grained sand with gravel and lenses of clay. The clay may be as much as 60 feet thick. In some areas, the formation also contains wood fragments. The part of the formation that contains the wood fragments may be as much as 25 feet thick (Marsh, 1966).

The aquifer contains lensatic zones within the sand that are cemented by iron-oxide minerals. The lenses, known locally as hardpans, have lower permeabilities and, along with the clay lenses, are responsible for the occurrence of perched water tables and semi-artesian conditions in the aquifer.

Floridan Aquifer System. Underlying the sediments of the sand-and-gravel aquifer is the thick (approximately 300 feet), relatively impermeable Pensacola Clay. Below the Pensacola Clay are thick layers of limestone and shale to a depth of nearly 2,000 feet.

The limestone layers constitute the regionally extensive Floridan aquifer system. In the area of NAS Whiting Field, the Floridan aquifer is divided into an upper and lower part separated by the Bucatunna Clay. The Floridan aquifer system receives little or no recharge from the sand-and-gravel aquifer because of the Pensacola Clay confining unit. The potentiometric surface of the Upper Floridan aquifer in the NAS Whiting Field area is about 50 to 55 feet above msl.

3.3.2 Site Hydrogeology

3.3.2.1 Capacity and Continuity of Confining Layers There are three major aquifers in the NAS Whiting Field area. The uppermost aquifer, the sand-and-gravel aquifer, exists under both artesian and non-artesian conditions depending on the presence or absence of semi-confining clay lenses. The two other aquifers, the Upper Floridan and the Lower Floridan, are deep artesian aquifers of the Floridan aquifer system.

Sand-and-Gravel Aquifer. The sand-and-gravel aquifer is recharged by infiltration of rainwater at the surface. Due to a clay layer of variable thickness and lateral extent at NAS Whiting Field, there are locally perched water tables present. This is the case at Site 2894 where the clay layer, approximately 15 feet thick, is located 80 feet bls. This clay layer forms an aquitard and subsequently creates a locally perched water table henceforth referred to as the upper zone of the sand-and-gravel aquifer.

The results of an aquifer test in the Milton area indicate the clayey sand confining unit separating the upper and lower aquifer zones is very leaky. In the NAS Whiting Field area, clay lenses occur in the uppermost 30 feet and in the depth interval of approximately 100 to 170 feet bls (elevation 10 to 70 feet above msl). Although the clays appear to be continuous, they may contain permeable zones or windows (NEESA, 1985). The direction of groundwater flow in the sand-and-gravel aquifer is generally to the southwest.

Groundwater in an upper waterbearing zone was encountered at depths ranging from 72.58 feet bls to 85.91 feet bls, or surface elevations from 80.39 feet to 83.31

feet above NGVD. Groundwater in a lower waterbearing zone was encountered from approximately 94.58 feet bls to 96.9 feet bls. The lower clay unit, at the site approximately 90 feet to 105 feet bls, forms a confining layer above the lower waterbearing zone, which is under pressure, and has a potentiometric surface elevation ranging from 69.71 feet to 70.75 feet above NGVD.

3.3.2.2 Aquifer Classification In Escambia County, which borders Santa Rosa County, the surficial zone of the sand-and-gravel aquifer has been demonstrated to be hydraulically connected with the main producing zone of the sand-and-gravel aquifer, making potable water supplies susceptible to contamination in these areas. It is suspected that this condition is also present in the NAS Whiting Field area due to the regionally discontinuous clay lenses. The upper waterbearing zone and the main producing zone of the Sand-and-Gravel aquifer at NAS Whiting Field are classified and regulated as a Class G-II water source according to Chapter 17-3, FAC.

3.3 WELL SURVEY. An inventory of potable water wells near NAS Whiting Field was conducted as part of the Hazard Ranking System (HRS) II scoring performed by ABB-ES in May 1991.

All potable and industrial water supplies in the NAS Whiting Field vicinity are obtained from the sand-and-gravel aquifer. This aquifer extends from the surface to an approximate depth of 300 feet bls. Screened intervals of most production wells are at a depth of about 150 to 350 feet bls, depending on the surface elevation and the presence of clay lenses.

3.3.1 Private Wells No privately controlled potable wells are located within a 0.25-mile radius of Site 2894.

3.3.2 Public Wells Water for the City of Milton and for the Point Baker - Allentown area is supplied by nine wells; all of which are screened in the sand-and-gravel aquifer and are outside a 1-mile radius of NAS Whiting Field.

Potable water on base is currently supplied by three production wells: the north (W-N4), south (W-S2), and west (W-W3) production wells (Figure 3-6). All of these wells are within 0.50-mile radius of the site. These production wells replaced previously existing wells that were abandoned because of insufficient capacity or poor water quality. When the base was built in 1943, three production wells were drilled: the original north (W-N1), south (W-S1), and west (W-W1) wells. In 1951, these wells were abandoned and replaced by new wells (W-N2, W-S2, and W-W2) each within 75 feet of the original well. These new wells were constructed to deliver increased yields.

The west and north wells, however, contained objectionable levels of iron and were replaced by W-W3 in 1965 and W-N3, respectively, in 1975. The replacement north well, originally drilled as a test well, was also found to have unacceptable iron concentrations and was subsequently abandoned and replaced by the currently used north production well (W-N4).

Current average pumping capacities from the wells at NAS Whiting Field are: north well (W-N4), 600 gallons per minute (gpm); west well (W-W3), 700 gpm; and

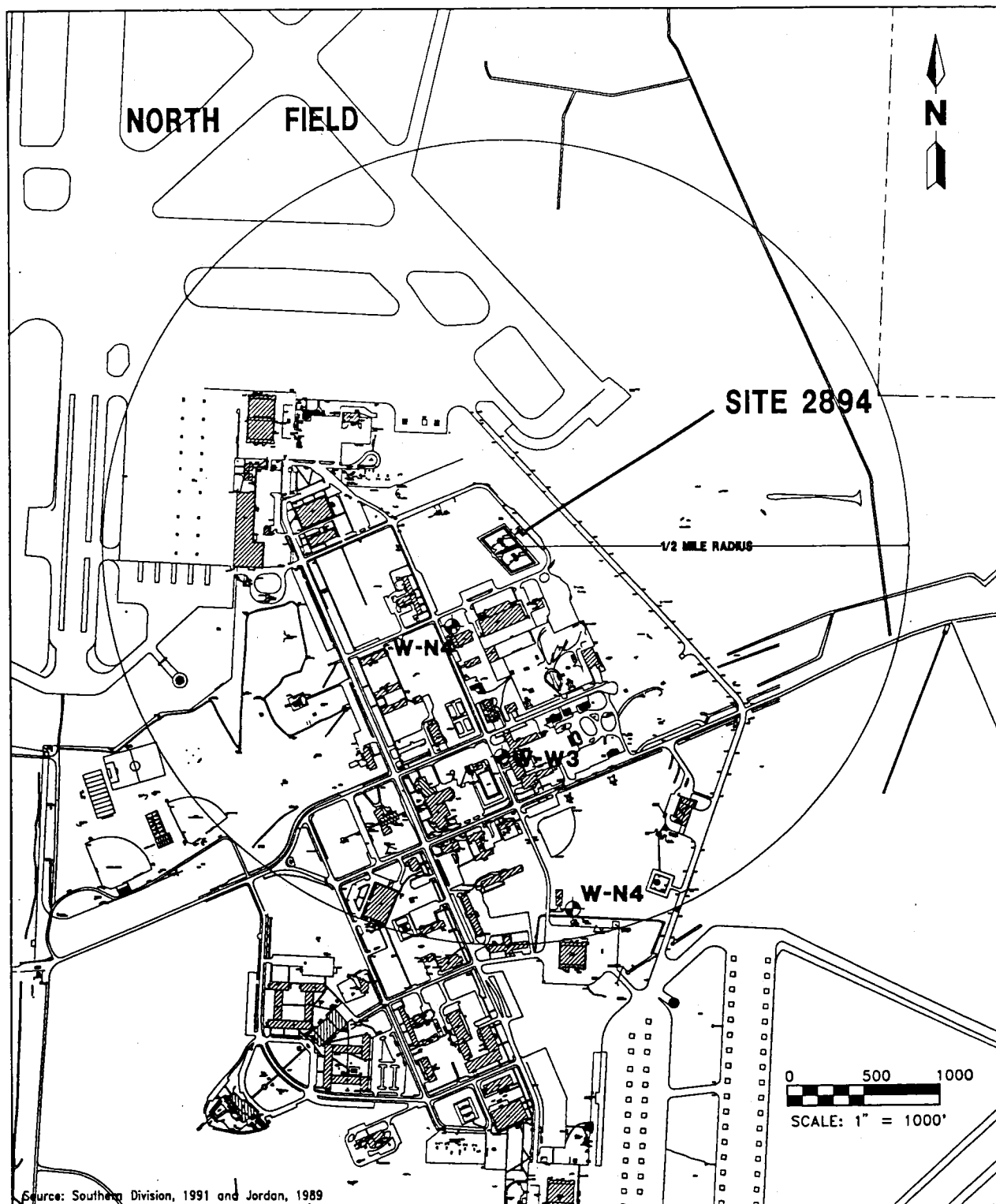


FIGURE 3-6
ACTIVE NAVY PRODUCTION WELLS
AT NAS WHITING FIELD



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA

south well (W-S2), 500 gpm. At the request of the FDEP, supply well W-S2 was shut down on 28 August 1986, due to concentrations of benzene exceeding the Florida drinking water standard of 1.0 microgram per liter ($\mu\text{g}/\ell$) in the groundwater. Production well W-W3 was also shut down on September 25, 1986, due to concentrations of trichloroethene greater than the State standard of 3 $\mu\text{g}/\ell$. The wells were reactivated after installation of treatment systems. The treatment systems consist of granular activated carbon treatment at the wellhead followed by chlorination, pH adjustment, and addition of a sequestering agent to reduce iron precipitation. Production well W-W3 has a granular activated carbon filter unit installed to reduce the concentration of trichloroethene detected in the groundwater.

NAS Whiting Field operated with service from only the north production well throughout most of 1987. Testing of an activated carbon adsorption filtration system to treat water from the west well (W-W3) for trichloroethene removal began on November 3, 1987. Upon completion of the operational tests on December 1, 1987, the west well was returned to service. At the south production well (W-S2), an activated carbon filtration system was installed in early 1990. The north production well has been sampled, pending the analytical results an activated carbon filtration system will be installed. Pumping rates, well depths, and screen intervals for the three base production wells are shown in Table 3-1 (Locklear, 1983).

Table 3-1

Production Rates for NAS Whiting Field Supply Wells

Contamination Assessment Report

Site 2894, Naval Air Station Whiting Field

Milton, Florida

Well Designation	Pumping Rate (gpm)	Total Depth (feet)	Screen Interval
W-N4	600	230	156 - 230
6W-W3	700	263	179 - 263
W-S2	500	234	160 - 234

Note: gpm = gallons per minute.

4.0 METHODOLOGIES AND EQUIPMENT

4.1 SOIL BORING PROGRAM. Forty-two soil borings, AST-SB-2 through AST-SB-11, and AST-SB-13 through AST-SB-44, were completed at Site 2894 (Figure 4-1). Soil borings AST-SB-1 and AST-SB-12 were installed as part of the CA for Site 2891. These borings were drilled at the site to:

- assess the vertical and horizontal extent of petroleum-contaminated soil at the site,
- assess areas where visual observations and historical information indicated possible sources of contamination,
- characterize the subsurface sediments, and
- aid in the placement of subsequent groundwater monitoring wells.

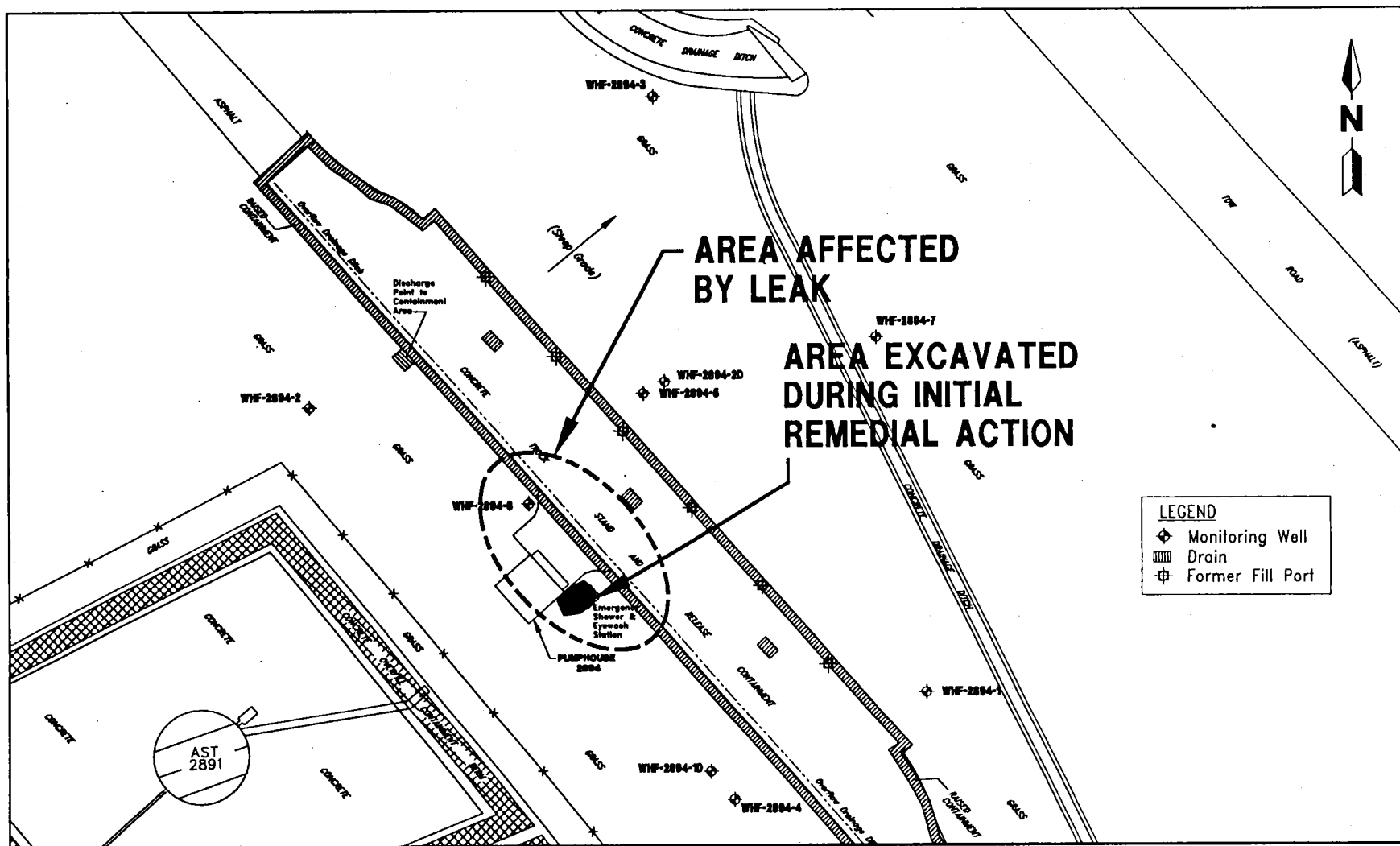
Soil borings AST-SB-2 through AST-SB-11 were installed from February to May 1992 to depths varying from 52 to 117 feet bls. In all of these borings except AST-SB-4, OVA headspace readings of soil samples were less than 10 parts per million (ppm) below depths of 50 feet bls. OVA headspace data from these borings were presented to FDEP to show that additional proposed soil borings need not be drilled to the water table to adequately assess the vertical and horizontal extent of soil contamination at the site. FDEP agreed that proposed soil borings AST-SB-13 through AST-SB-44 could be terminated in the unsaturated zone providing OVA headspace readings of the two previous sample intervals, sampling at 5 foot

intervals, were less than 10 ppm. Soil borings AST-SB-13 through AST-SB-44 were installed from May through June 1993. Lithologic logs for all soil borings are located in Appendix B, Lithologic Logs.

Boreholes were advanced using a drill rig equipped with hollow-stem augers (HSAs). Soil borings AST-SB-2 through AST-SB-11 were installed with 4½-inch inside diameter (ID) HSAs, and AST-SB-13 through AST-SB-44 were installed with 2½-inch ID HSAs. Soil borings were sampled at five foot intervals from ground surface to total depth to obtain lithologic and assessment information. Upon completion of sampling, the borehole was filled with neat cement (Portland Type I) to approximately 6 feet bls and then backfilled with soil.

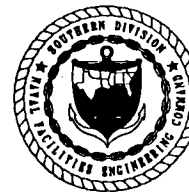
4.2 MONITORING WELL PROGRAM. Nine monitoring wells were installed at Site 2894, seven in the upper waterbearing zone, WHF-2894-1 through WHF-2894-7 and two, WHF-2894-1D and WHF-2894-2D, in the lower waterbearing zone at the site. Monitoring well locations are shown in Figure 4-2. Monitoring well completion logs are located in Appendix B. Monitoring wells WHF-2894-5, WHF-2894-6, and WHF-2894-2D were placed within the plume of excessively contaminated soil to assess if groundwater contamination is present and if so, the vertical and horizontal extent of groundwater contamination. Monitoring well WHF-2894-7 was placed at the downgradient edge of the soil contamination to monitor possible groundwater contamination. The remaining monitoring wells were placed around the contaminated soil area to assess the extent of possible groundwater contamination.

Typical monitoring wells were installed using a drill rig equipped with 6½-inch inside diameter hollow-stem augers. Double cased wells were installed for all



0 30 60
SCALE: 1" = 60'

FIGURE 4-2
MONITORING WELL LOCATION MAP



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA

deep wells using a mud rotary drill rig. The 8-inch diameter surface casing was set approximately 2 feet below the top of the lower clay layer.

Soil samples were collected from the monitoring well borehole prior to well installation using a Standard Penetration Test (SPT) split-spoon sampler. The soil samples were collected at 5-foot intervals to the vadose zone. A final sample was collected at approximately 1 to 3 feet above the groundwater table. The soil samples were screened using an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID) using procedures described in Chapter 17-770, FAC. Additional sample screening was performed using a portable gas chromatograph (GC) calibrated to detect benzene, toluene, ethyl benzene, xylenes (BTEX), methyl tert-butyl ether (MTBE), trichloroethene (TCE), and tetrachloroethene (PCE) to the parts per billion (ppb) level. The additional screening was performed on both groundwater and soil samples at and near the groundwater surface. The purpose of the OVA and GC screening procedure was to optimize monitoring well placement during the investigation.

Monitoring wells installed during the investigation were constructed of schedule 40 polyvinyl chloride (PVC) casing with flush-threaded joints and 0.010-inch slotted screen. Surface casings, installed prior to well installation, were constructed of 8-inch inner diameter schedule 40 PVC casing with slip couplings secured with stainless steel screws and sealed at the bottom with a slip cap. The shallow monitoring wells were constructed of 4-inch PVC with a 15-foot screen section placed at a depth that encompassed seasonal water table fluctuations. The well casing extends from the top of the screen to land surface. A 20/30 grade silica filter pack was placed in the annular space around the well screen to approximately 2 feet above the top of the screen. A 2-foot fine sand seal,

30/65 grade, was placed on top of the filter pack. The remaining annular space was grouted to the surface with a neat cement grout. A protective traffic-bearing subsurface vault was installed to complete well installation. Monitoring wells are equipped with a locking well cap and a padlock. Figures 4-3 and 4-4 depict typical monitoring well installations.

4.3 GROUNDWATER ELEVATIONS. The elevation and slope of the water table were determined by surveying the top of the well casing for each monitoring well to a common reference datum using a surveyor's level and stadia rod. A benchmark, stamped "C 113 1945," referencing the National Geodetic Vertical Datum (NGVD) of 1929 was used as the common reference datum.

4.4 GROUNDWATER SAMPLING PROGRAM. Groundwater samples were collected from all existing site monitoring wells from August 15 through August 18, 1992. The samples were sent to Wadsworth/ALERT Laboratories in Tampa, Florida, for analysis. Two laboratory blanks, one field blank, one equipment blank, one duplicate, and two trip blanks were also analyzed.

On 14 July 1993 groundwater samples were again collected from all existing site monitoring wells. The samples were sent to CH2M Hill in Alachua, Florida, for analysis. One field blank, one equipment blank, one duplicate, one MS/MSD pair, and one trip blank were also analyzed.

The groundwater samples were collected in accordance with the ABB-ES's FDEP-approved Comprehensive Quality Assurance Project Plan (ComQAP). Before sampling,

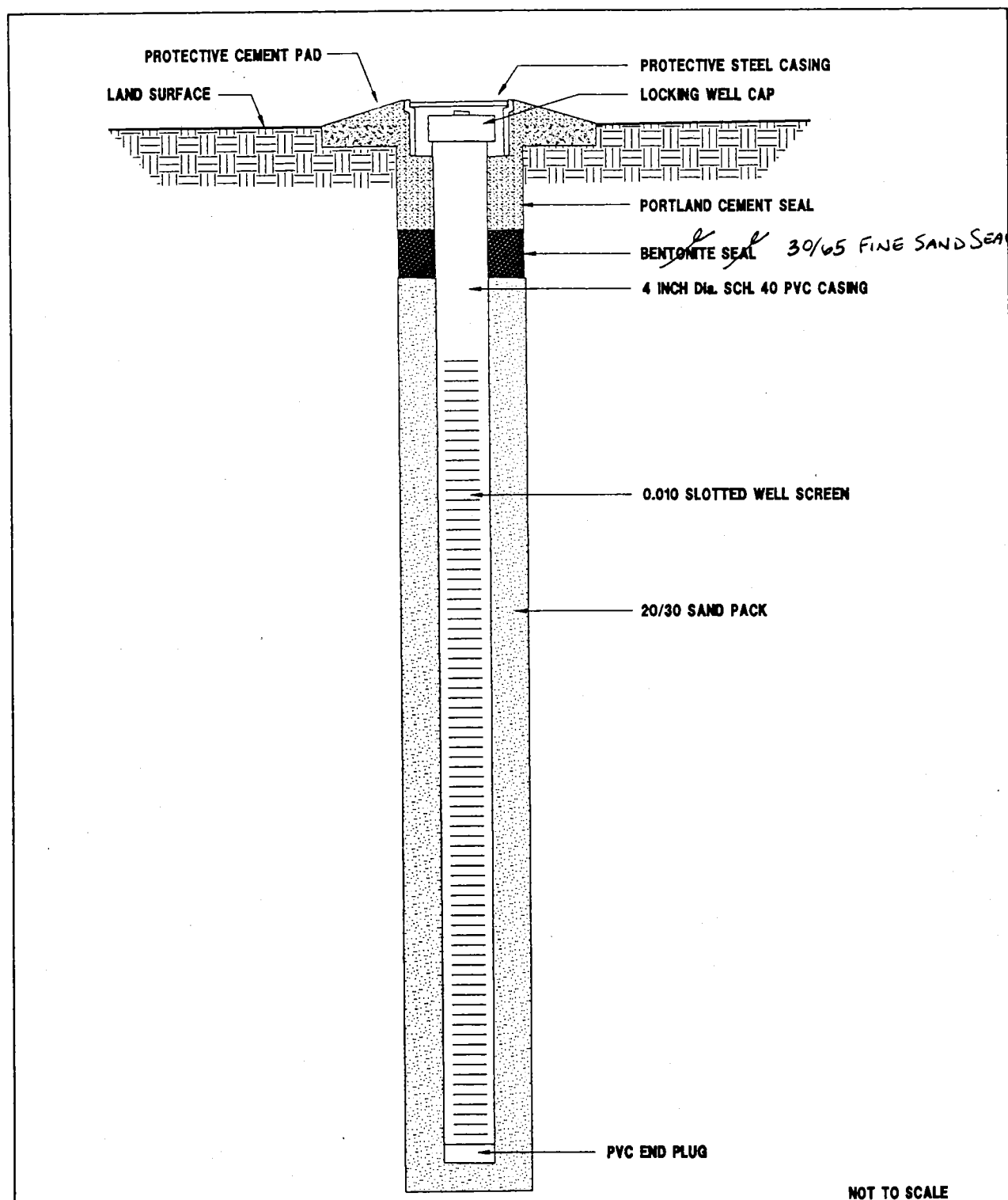
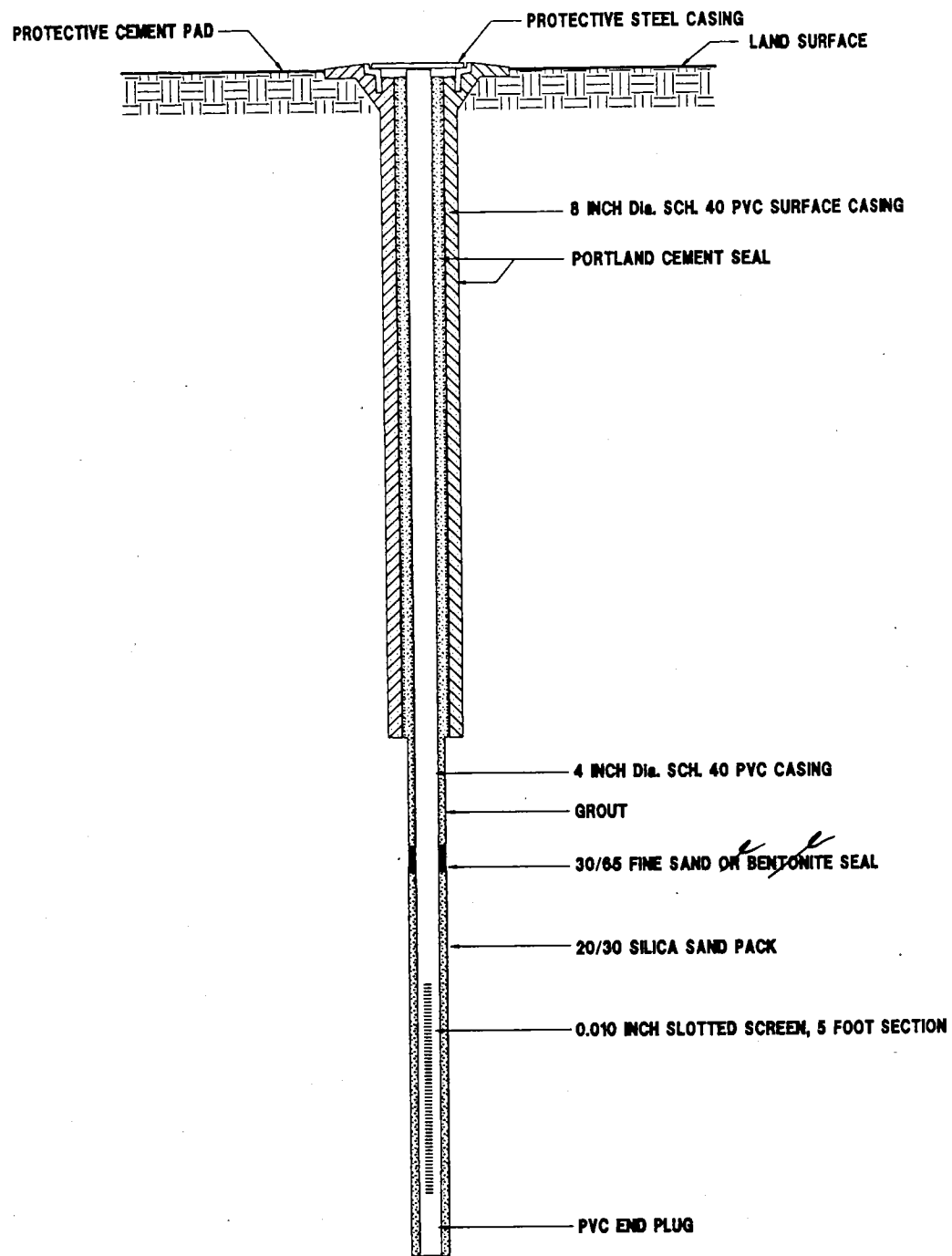


FIGURE 4-3
TYPICAL SHALLOW MONITORING WELL
INSTALLATION DETAIL



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA



NOT TO SCALE

FIGURE 4-4
TYPICAL DEEP MONITORING WELL
INSTALLATION DETAIL

TAMWELL/MP/9-21-83



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA

all monitoring wells were purged with a submersible pump equipped with a ball check valve. Purging continued until water quality parameters (specific conductance, temperature, and pH) had stabilized, five well volumes were removed, or the well was pumped dry. Groundwater samples were collected using an extruded Teflon™ bailer. The samples were placed into appropriate containers, properly preserved, and placed on ice. Samples were then shipped to the previously mentioned laboratories for analyses within 24 hours after collection. All groundwater samples collected during the contamination assessment (CA) were analyzed for the kerosene analytical group compounds as described in Chapter 17-770, FAC.

5.0 CONTAMINATION ASSESSMENT RESULTS

5.1 AQUIFER CHARACTERISTICS. Three falling head and two rising head slug tests were conducted in monitoring wells WHF-2894-6 and WHF-2894-7 to estimate the hydraulic conductivity of the sand-and-gravel aquifer during the CA. Monitoring wells WHF-2894-6 and WHF-2894-7 have screen intervals of 80.0 feet to 90.0 feet bls and 69.0 feet to 84.0 feet bls, respectively. Both of these wells are screened in the upper waterbearing zone at the site.

The water level in monitoring well WHF-2894-4, screened in the upper waterbearing zone was 81.79 feet bls or an elevation of 83.07 feet. Well WHF-2894-1D, adjacent to WHF-2894-4, is screened below the lower clay unit and has a water level of 94.58 feet bls, or an elevation of 70.33 feet. The difference in water level elevations in these wells indicates that the clay layer forms an effective aquitard between the upper and lower waterbearing zones.

5.1.1 Piezometer Surface Depth to groundwater measurements were collected on July 31, August 18, 1992, June 5, and July 12, 1993. The groundwater levels were measured using an electronic water level indicator with an accuracy to 0.01 foot. Water level elevations were calculated by subtracting the measured depth to groundwater from the elevation at the top of the well casing (Table 5-1). This information was plotted as a water table contour maps where flow lines (depicting groundwater flow direction) were drawn perpendicular to the groundwater elevation contours (Figures 5-1 through 5-4).

These figures indicate a northeast flow direction in the upper waterbearing zone which generally conforms with the north-northeast dip of the clay confining layer. The groundwater flow direction in the lower waterbearing zone is generally toward the south-southwest (ABB-ES Environmental Services, Inc., 1992a).

5.1.2 Horizontal Groundwater Flow Velocity The average hydraulic conductivity for the site was ascertained from slug tests that were performed at two monitoring wells, WHF-2894-6 and WHF-2894-7. The slug test data was evaluated using Aqtesolv™ (Geraghty & Miller, 1989) to plot and estimate hydraulic conductivities. The results from the slug tests are shown in Table 5-2. The hydraulic conductivities vary between the two monitoring wells tested and between test types, rising head versus falling head. The difference in values at each monitoring well can be attributed to the difference in lithology. Since six of the seven wells in the upper zone of the sand-and-gravel aquifer have lithologies similar to WHF-2894-7, the average hydraulic conductivity computed from the slug tests performed on this well are the most representative of the site. The falling head test is more appropriate in the case of fine-grained soils with low permeability (Das, 1990) therefore the average hydraulic conductivity computed from the falling head tests from WHF-2894-7 will be used. The average horizontal conductivity is 2.5×10^{-3} feet per min (ft/min).

The average hydraulic gradient across the site was determined by dividing the difference in water level elevations by the distance between the two respective measurement locations. From the water elevation data collected on 7 July 1993, the hydraulic gradient was computed to be 1.1×10^{-2} feet per foot (ft/ft).

Table 5-1
Top of Casing and Groundwater Elevations

Contamination Assessment Report
Site 2894, Naval Air Station Whiting Field
Milton, Florida

Well Number	July 31, 1992			August 18, 1992			June 5, 1993			July 12, 1993		
	TOC (feet)	DTW (feet)	Groundwater Elevation	TOC (feet)	DTW (feet)	Groundwater Elevation	TOC (feet)	DTW (feet)	Groundwater Elevation	TOC (feet)	DTW (feet)	Groundwater Elevation
WHF-2984-1	167.00	85.14	81.86	167.00	85.91	81.09	167.00	85.18	81.82	167.00	84.90	82.10
WHF-2984-2	159.00	76.31	82.69	159.00	76.56	82.44	159.00	76.44	82.56	159.00	75.99	83.01
WHF-2984-3	154.17	72.88	81.29	154.17	73.78	80.39	154.17	72.75	81.42	154.17	72.58	81.59
WHF-2984-4	164.86	81.79	83.07	164.86	82.00	82.86	164.86	81.82	83.04	164.86	81.55	83.31
WHF-2984-5	167.52	85.66	81.86	167.52	85.91	81.61	167.52	85.68	81.84	167.52	85.35	82.17
WHF-2984-6	166.86	84.33	82.53	166.86	84.58	82.28	166.86	84.32	82.54	166.86	84.09	82.77
WHF-2894-7	NI	NI	NI	NI	NI	NI	159.07	78.22	80.85	159.07	77.93	81.14

WHF-2984-1D ¹	164.91	94.58	70.33	164.91	94.71	70.20	164.91	95.02	69.89	164.91	95.20	69.71
WHF-2984-2D ¹	167.08	96.33	70.75	167.08	96.48	70.60	167.08	96.75	70.33	167.08	96.90	70.18
¹ Double cased well with screen interval in the lower waterbearing zone of sand-and-gravel aquifer. Notes: TOC = top of casing elevation. DTW = depth to water below TOC. NI = not installed until May 20, 1993.												

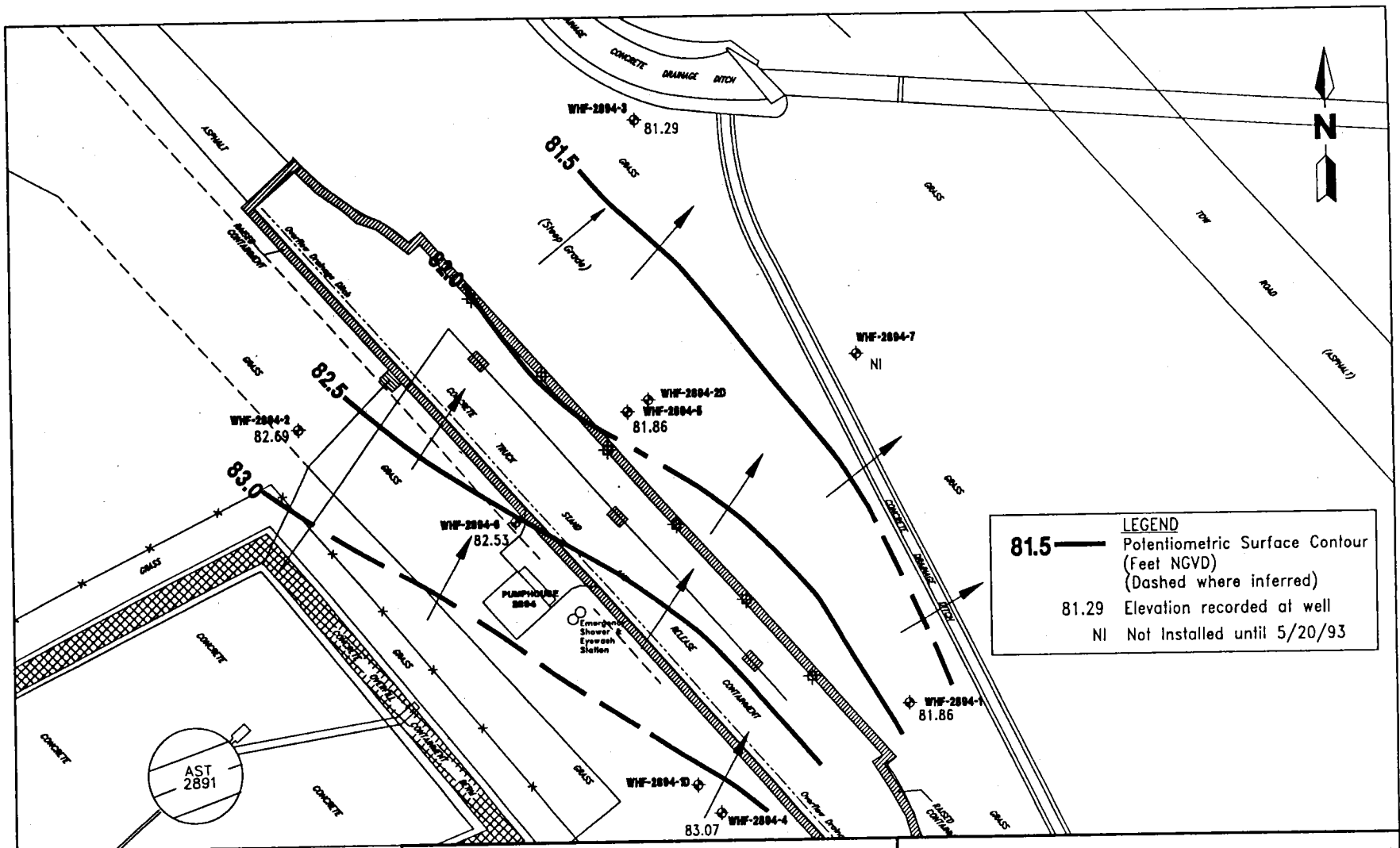
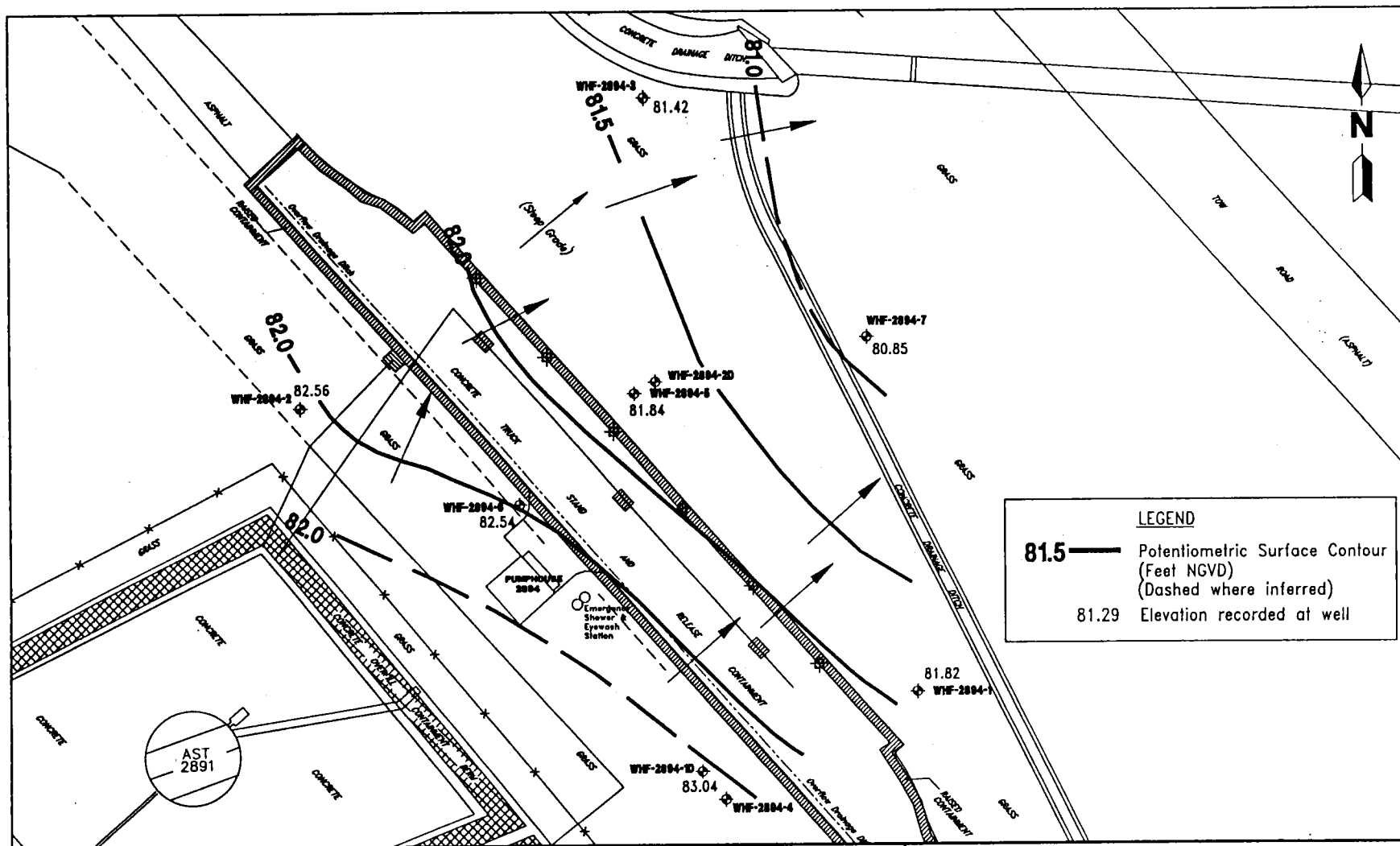


FIGURE 5-1
PIEZOMETRIC SURFACE MAP OF THE
SAND-AND-GRAVEL AQUIFER, UPPER WATERBEARING
JULY 31, 1992
ZONE



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA



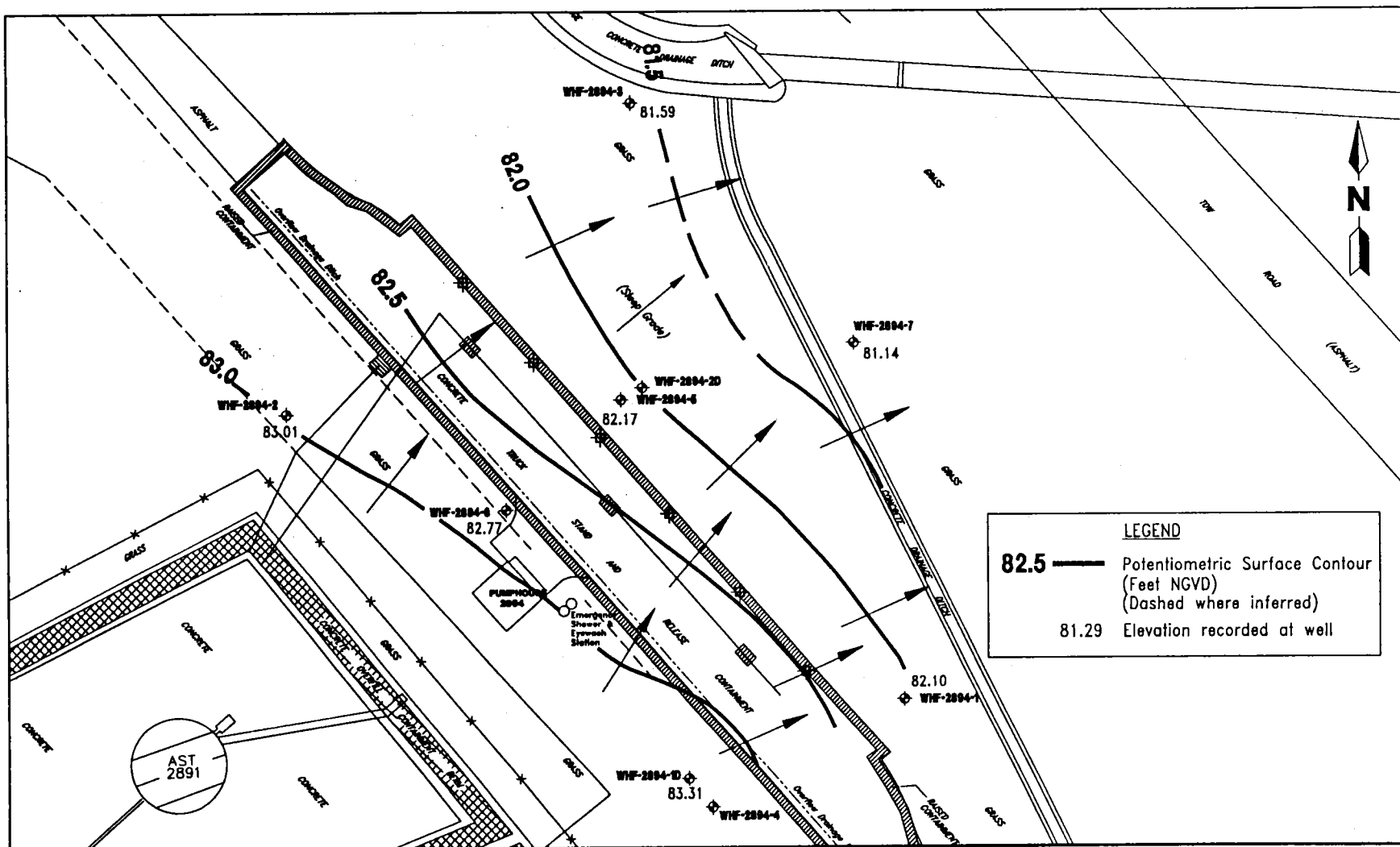
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SCALE: 1" = 60'

FIGURE 5-3
PIEZOMETRIC SURFACE MAP OF THE SAND-AND-GRAVEL AQUIFER, UPPER ZONE
JUNE 5, 1993



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA



0 30 60
SCALE: 1" = 60'

FIGURE 5-4
PIEZOMETRIC SURFACE MAP OF THE
SAND-AND-GRAVEL AQUIFER, UPPER ZONE
JULY 12, 1993



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA

<p align="center">Table 5-2</p> <p align="center">Estimated Hydraulic Conductivities Evaluated Using Aqtesolv™¹</p> <p align="center">Contamination Assessment Report</p> <p align="center">Site 2894, Naval Air Station Whiting Field</p> <p align="center">Milton, Florida</p>				
Monitoring Well	Estimated Hydraulic Conductivities			
	WHF-2894-6		WHF-2894-7	
	ft/min	ft/day	ft/min	ft/day
Falling Head	0.002009	2.89296	0.002692	3.87648
Falling Head	0.000173	0.249552	0.002239	3.22416
Falling Head	0.000177	0.254448	0.002462	3.54528
Average	0.000786	1.13232	0.002464	3.54864
Rising Head	0.000205	0.2952	0.003417	4.92048
Rising Head	0.00032	0.460368	0.005069	7.29936
Average	0.000262	0.377784	0.004243	6.10992
AVERAGE	0.000577	0.830506	0.003176	4.573152
<p>¹Geraght & Miller, Inc., 1989.</p> <p>Notes: ft/min = foot per minute.</p> <p>ft/day = foot per day.</p>				

The effective porosity for silty sand and well sorted sands ranges from 0.18 to 0.27 (Fetter, 1980). An average value for effective porosity of .23 was selected for the seepage velocity calculations. The calculated pore water velocity (V) is 1.2×10^{-4} feet/minute (ft/min) or 0.17 feet/day (ft/day). The slug tests, equations, and calculations used to reach these values are presented in Appendix C, Aquifer Parameter Calculations.

5.2 CONTAMINANT PLUME DEFINITION AND CHARACTERIZATION.

5.2.1 Quality Assurance Project Plan ABB-ES has an approved ComQAP with FDEP.

5.2.2 Soil Assessment Forty-two soil borings were conducted at Site 2894 to assess possible petroleum contamination. The placement of the borings were arranged to check all possible sources of contamination according to site history and background; to delineate vertical and horizontal extent of contamination; and to aid in placement of monitoring wells.

Of the 42 soil borings, volatile organic compounds (VOCs) were detected in 18 borings in excess of State target levels of 50 ppm for the Kerosene Analytical Group. The levels of excessive soil contamination in seventeen of these borings ranged from land surface to 35 feet bls. In one boring, AST-SB-4, which is located in the center of a suspected release point, has excessively contaminated soil extended to a depth of 55 feet bls. OVA data collected at the time of boring installation is plotted and contoured in Figures 5-5 through 5-10 and tabulated in Table 5-3. These figures show the horizontal extent of the petroleum contaminated soil. The axis of this plume is approximately 340 feet

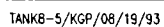
in trending northeast to southwest, and approximately 220 feet in trending northwest to southeast.

Cross sections showing the vertical and horizontal extent of contamination at the site are shown in Figures 5-11 through 5-13. The soil contamination decreases in depth and concentration with distance from the source. The source is located approximately at AST-SB-4.

5.3.3 Groundwater Assessment The results of the August 1992 and July 1993 groundwater sample collected indicate there is no significant groundwater contamination in the site area (Figure 5-14). Analytical results of the groundwater samples collected August 1992 indicate only two monitoring wells had detectable concentrations of kerosene analytical group components. In monitoring well WHF-2894-1D, TRPH was detected at 2 milligrams per liter (mg/l). This is below the State regulatory standard of 5 mg/l.

In monitoring well WHF-2894-3, EDB was detected at .09 micrograms per liter ($\mu\text{g/l}$). This is above the State regulatory standard of .02 mg/l.

In the July 1993 analytical results monitoring well WHF-2894-1 indicate TRPH at .06 mg/l (Figure 5-15). This is below the State regulatory standard of 5 mg/l. In monitoring wells WHF-2894-1, WHF-2894-3, and WHF-2894-4, lead was detected at 2 $\mu\text{g/l}$, 2 $\mu\text{g/l}$, and 20 $\mu\text{g/l}$, respectively. These samples were not filtered and had high suspended sediment contents which could cause the elevated concentrations of lead in the groundwater. These concentrations are below the State regulatory standard of 50 $\mu\text{g/l}$. In monitoring well WHF-2894-3, EDB was detected at .06 $\mu\text{g/l}$. This is above the State regulatory standard of .02 $\mu\text{g/l}$.



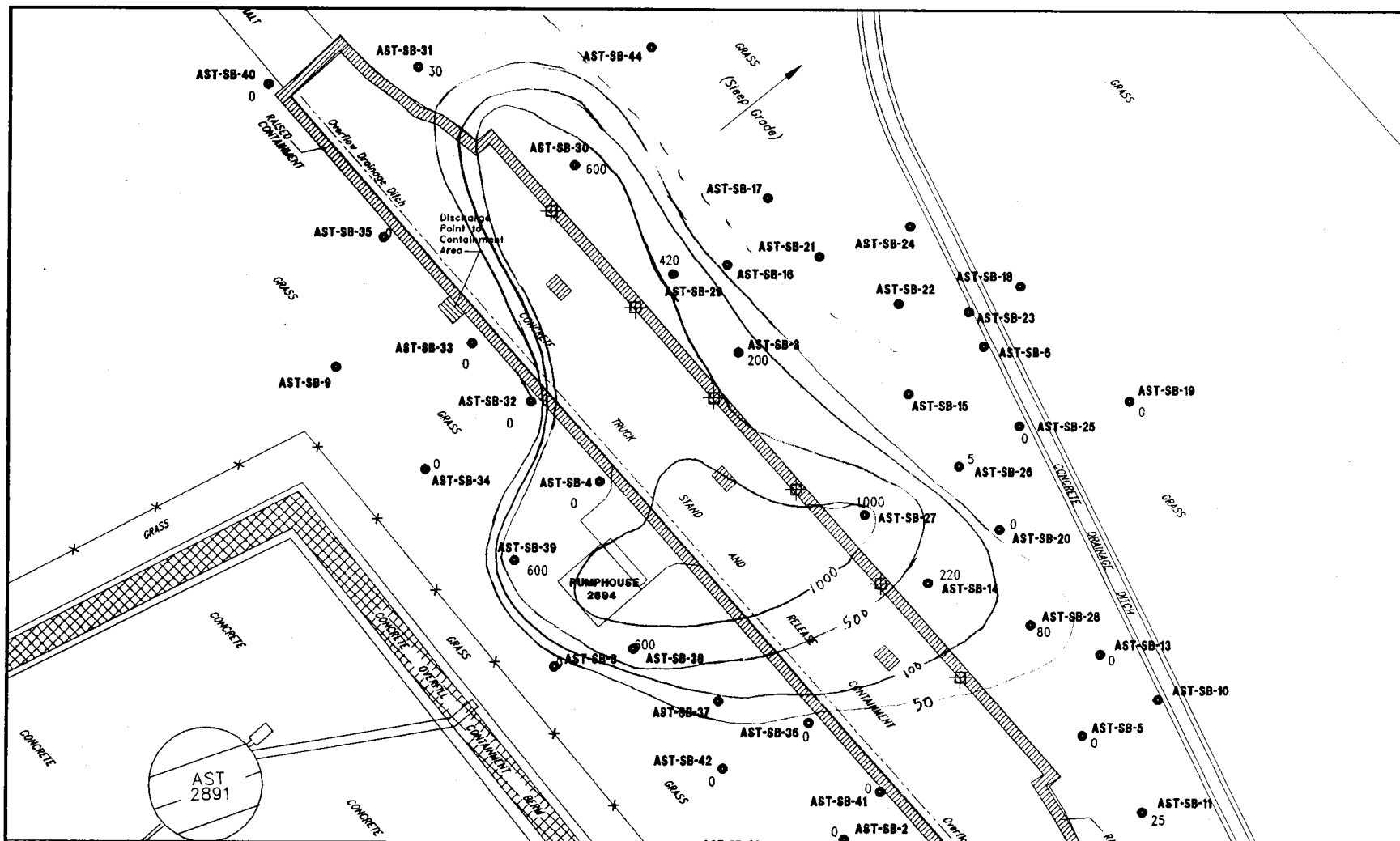
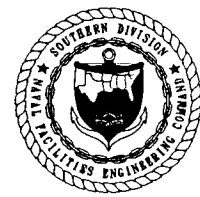


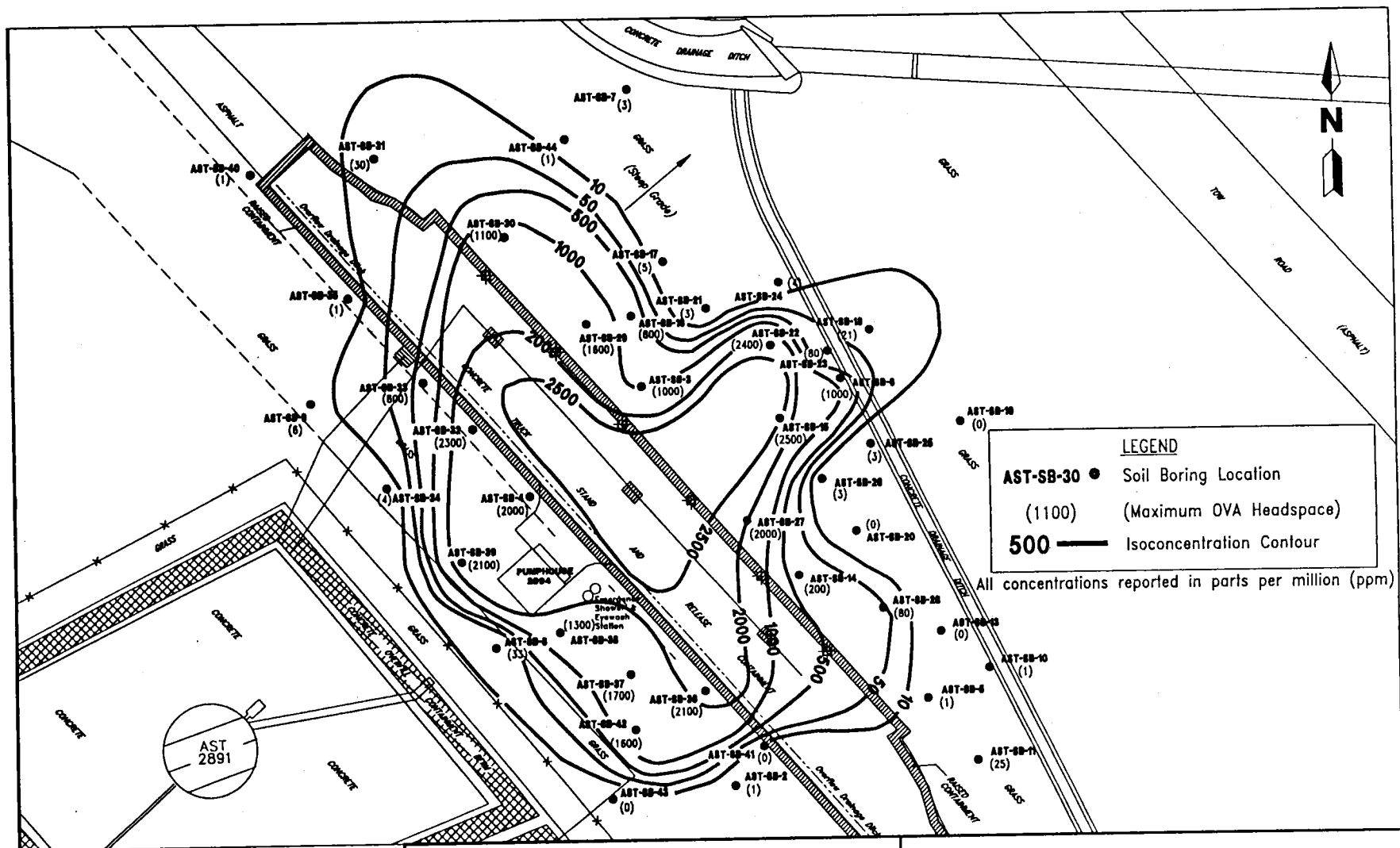
FIGURE
160' msl *Headspace Concentrations*



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA





0 30 60 50
SCALE: 1" = 60'
50'

FIGURE 5-10
MAXIMUM SOIL BORING OVA
HEADSPACE CONCENTRATIONS



SITE 2894

NAS WHITING FIELD
MILTON, FLORIDA

Table 5-3

Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analytical Data

February 1991 through July 1993

Contamination Assessment Report

Site 2894, NAS Whiting Field

Milton, Florida

Depth (feet bls)	Headspace Readings at Boring Designation,										
	AST-SB-2	AST-SB-3	AST-SB-4	AST-SB-5	AST-SB-6	AST-SB-7	AST-SB-8	AST-SB-9	AST-SB-10	AST-SB-11	AST-SB-12
0 to 5	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
5 to 7	0	200	0	0	0	0	0	0	0	25	0
10 to 12	0	150	100	0	0	0	0	1	0	0	0
15 to 17	0	1,000	350	0	0	0	6	1	0	0	0
20 to 22	0	280	500	0	700	0	0	2	0	0	0
25 to 27	0	1,000	2,000	0	1,000	NM	NM	2	0	0	0
30 to 32	0	450	2,000	0	1,000	NM	33	2	1	1	0
35 to 37	0	32	2,000	0	280	0	4	2	0	0	0
40 to 42	0	30	2,000	0	11	1	0	1	0	0	0
45 to 47	0	10	60	0	10	0	1	1	0	0	0
50 to 52	0	1	200	0	4	3	2	0	0	0	2
55 to 57	0	8	80	0	3	0	2	1	NS	NS	2

See notes at end of table.											
60 to 62	0	14	20	0	5	0	0	0	0	NS	NS
65 to 67	0	6	14	0	6	0	0	0	0	NS	NS
70 to 72	1	2	15	0	1	3	0	0	0	NS	NS
75 to 77	0	2	6	0	5	NM	2	0	0	NS	NS
80 to 82	0	7	0	1	NM	0	4	1	0	NS	NS
85 to 87	NM	0	NM	0	NM	0	0	0	0	NS	NS
90 to 92	0	0	5	0	NM	0	0	0	0	NS	0
95 to 97	NM	0	0	0	BGW	0	NM	6	NS	NS	NS
100 to 102	BGW	BGW	3	BGW	BGW	BGW	3	NS	NS	NS	NS
105 to 107	BGW	BGW	NM	BGW	BGW	BGW	BGW	NS	NS	NS	NS
110 to 112	BGW	BGW	BGW	BGW	BGW	BGW	BGW	NS	NS	NS	NS
115 to 117	BGW	BGW	BGW	NS	NS	BGW	BGW	NS	NS	NS	NS

Table 5-3 (Continued)

Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analytical Data

February 1991 through July 1993

Contamination Assessment Report

Site 2894, NAS Whiting Field

Milton, Florida

Depth (feet bls)	Headspace Readings at Boring Designation,										
	AST-SB-13	AST-SB-14	AST-SB-15	AST-SB-16	AST-SB-17	AST-SB-18	AST-SB-19	AST-SB-20	AST-SB-21	AST-SB-22	AST-SB-23
0 to 5	0	NM	1,800	NM	0	3	0	0	0	0	0
5 to 7	0	200	1,000	800	NM	0	0	0	0	0	0
10 to 12	0	50	50	60	1	2	0	0	0	0	0
15 to 17	0	25	80	9	1	0	0	0	3	0	0
20 to 22	0	1	2,000	18	2	21	0	0	3	2400	80
25 to 27	0	0	2,500	45	2	15	0	0	2	1400	3
30 to 32	0	0	8	5	3	4	0	0	3	50	8
35 to 37	0	0	28	5	2	4	0	0	1	100	3
40 to 42	0	0	12	5	2	2	0	0	2	10	4
45 to 47	0	0	4	2	5	2	NS	NS	0	7	11
50 to 52	NS	NS	2	2	NS	8	NS	NS	NS	9	5
55 to 57	NS	NS	NS	NS	NS	1	NS	NS	NS	15	0

60 to 62	NS	NS	NS	NS	NS	1	NS	NS	NS	4	NS
65 to 67	NS	NS	NS	NS	NS	4	NS	NS	NS	1	NS
70 to 72	NS	NS	NS	NS	NS	0	NS	NS	NS	NS	NS
75 to 77	NS	NS	NS	NS	NS	1	NS	NS	NS	NS	NS
80 to 82	NS	NS	NS	NS	NS	SAT	NS	NS	NS	NS	NS
85 to 87	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
90 to 92	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
95 to 97	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
100 to 102	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
105 to 107	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
110 to 112	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
115 to 117	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
See notes at end of table.											

Table 5-3 (Continued)

Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analytical Data

February 1991 through July 1993

Contamination Assessment Report

Site 2894, NAS Whiting Field

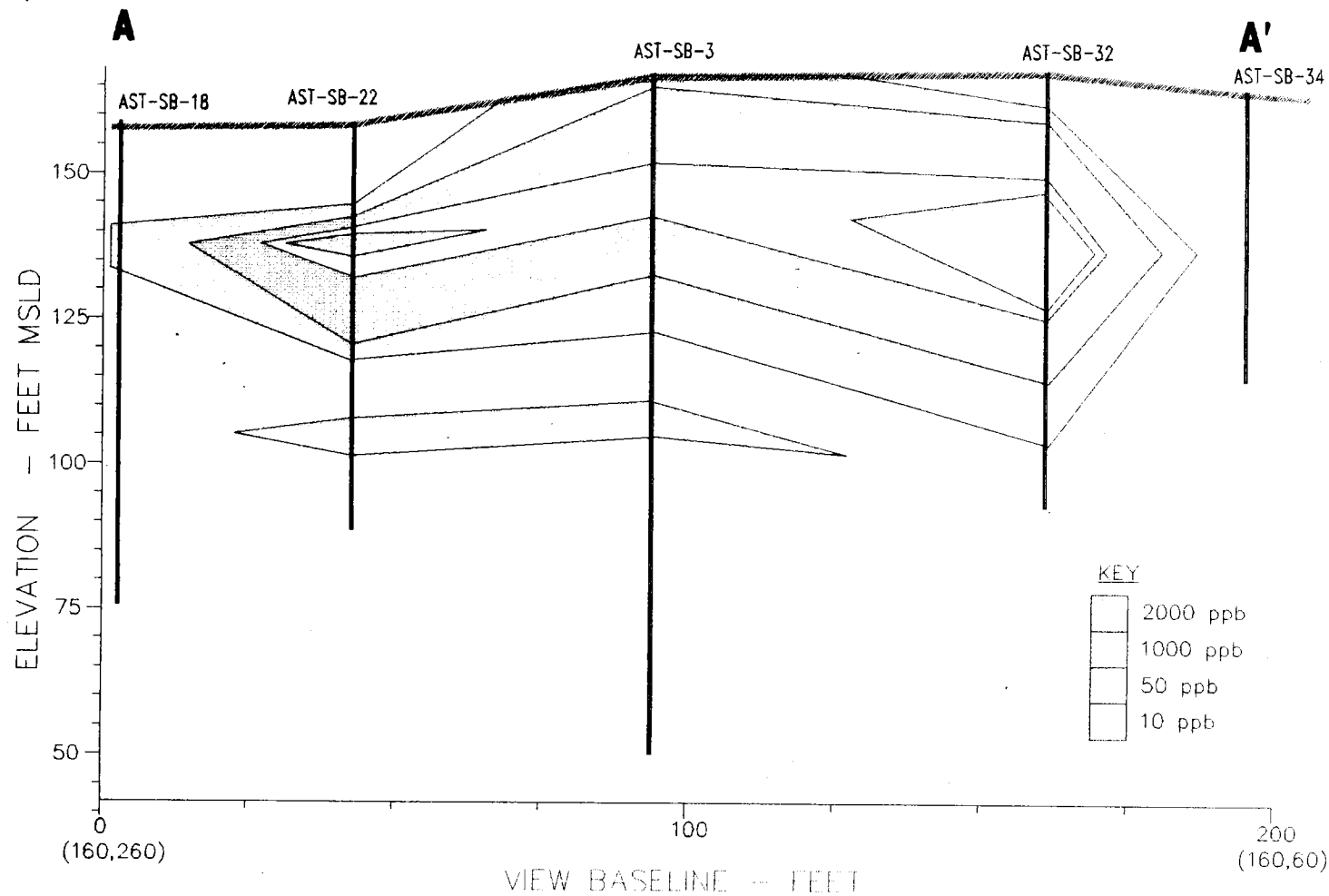
Milton, Florida

Depth (feet bls)	Headspace Readings at Boring Designation,										
	AST-SB-24	AST-SB-25	AST-SB-26	AST-SB-27	AST-SB-28	AST-SB-29	AST-SB-30	AST-SB-31	AST-SB-32	AST-SB-33	AST-SB-34
0 to 5	0	0	5	200	1	4	6	0	0	4	0
5 to 7	0	0	5	1,000	80	420	600	30	0	0	0
10 to 12	0	0	0	140	8	700	1,100	6	80	40	4
15 to 17	0	0	0	36	5	1,100	50	3	200	800	0
20 to 22	2	0	0	15	4	1,600	15	0	2,000	15	2
25 to 27	0	0	2	1,900	0	55	70	2	2,000	37	0
30 to 32	4	0	0	2,000	0	0	0	0	2,100	0	1
35 to 37	NM	1	0	SAT	SAT	22	0	0	2,300	0	2
40 to 42	3	1	3	70	SAT	10	0	0	2,300	4	2
45 to 47	2	3	1	6	0	1	0	0	50	4	0
50 to 52	3	NS	0	8	NS	14	NS	NS	90	NS	NS
55 to 57	NS	NS	NS	5	NS	4	NS	NS	17	NS	NS

60 to 62	NS	NS	NS	NS	NS	4	NS	NS	70	NS	NS
65 to 67	NS	NS	NS	NS	NS	NS	NS	NS	0	NS	NS
70 to 72	NS	NS	NS	NS	NS	NS	NS	NS	4	NS	NS
75 to 77	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
80 to 82	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
85 to 87	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
90 to 92	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
95 to 97	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
100 to 102	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
105 to 107	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
110 to 112	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
115 to 117	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
See notes at end of table.											

<p>Table 5-3 (Continued)</p> <p>Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analytical Data</p> <p>February 1991 through July 1993</p> <p>Contamination Assessment Report</p> <p>Site 2894, NAS Whiting Field</p> <p>Milton, Florida</p>										
Depth (feet bls)	Headspace Readings at Boring Designation,									
	AST-SB-35	AST-SB-36	AST-SB-37	AST-SB-38	AST-SB-39	AST-SB-40	AST-SB-41	AST-SB-42	AST-SB-43	AST-SB-44
0 to 5	0	0	NM	0	0	1	0	0	0	0
5 to 7	0	0	NM	600	600	0	0	NM	0	0
10 to 12	0	0	0	0	20	1	0	0	0	1
15 to 17	0	0	1,500	1,300	210	1	0	1,000	0	0
20 to 22	1	2,100	1,500	110	2	0	0	1,600	0	1
25 to 27	1	35	1,700	15	2,100	0	0	20	0	1
30 to 32	1	3	1,600	SAT	1,600	1	0	4	0	0
35 to 37	1	SAT	SAT	SAT	500	0	0	SAT	0	0
40 to 42	0	SAT	60	27	2,000	0	0	10	0	1
45 to 47	0	0	16	1	2,100	0	0	0	0	0
50 to 52	NS	0	2	4	SAT	NS	NS	2	NS	NS
55 to 57	NS	NS	5	NS	700	NS	NS	NS	NS	NS

60 to 62	NS	NS	NS	NS	80	NS	NS	NS	NS	NS
65 to 67	NS	NS	NS	NS	38	NS	NS	NS	NS	NS
70 to 72	NS	NS	NS	NS	24	NS	NS	NS	NS	NS
75 to 77	NS	NS	NS	NS	100	NS	NS	NS	NS	NS
80 to 82	NS	NS	NS	NS	9	NS	NS	NS	NS	NS
85 to 87	NS	NS	NS	NS	SAT	NS	NS	NS	NS	NS
90 to 92	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
95 to 97	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
100 to 102	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
105 to 107	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
110 to 112	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
115 to 117	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
<p>Notes: Concentrations are in parts per million (ppm).</p> <p>NS = not sampled.</p> <p>NM = not measured.</p> <p>BGW = below ground water.</p> <p>SAT = sample saturated (perched water).</p> <p>bis = below land surface.</p>										



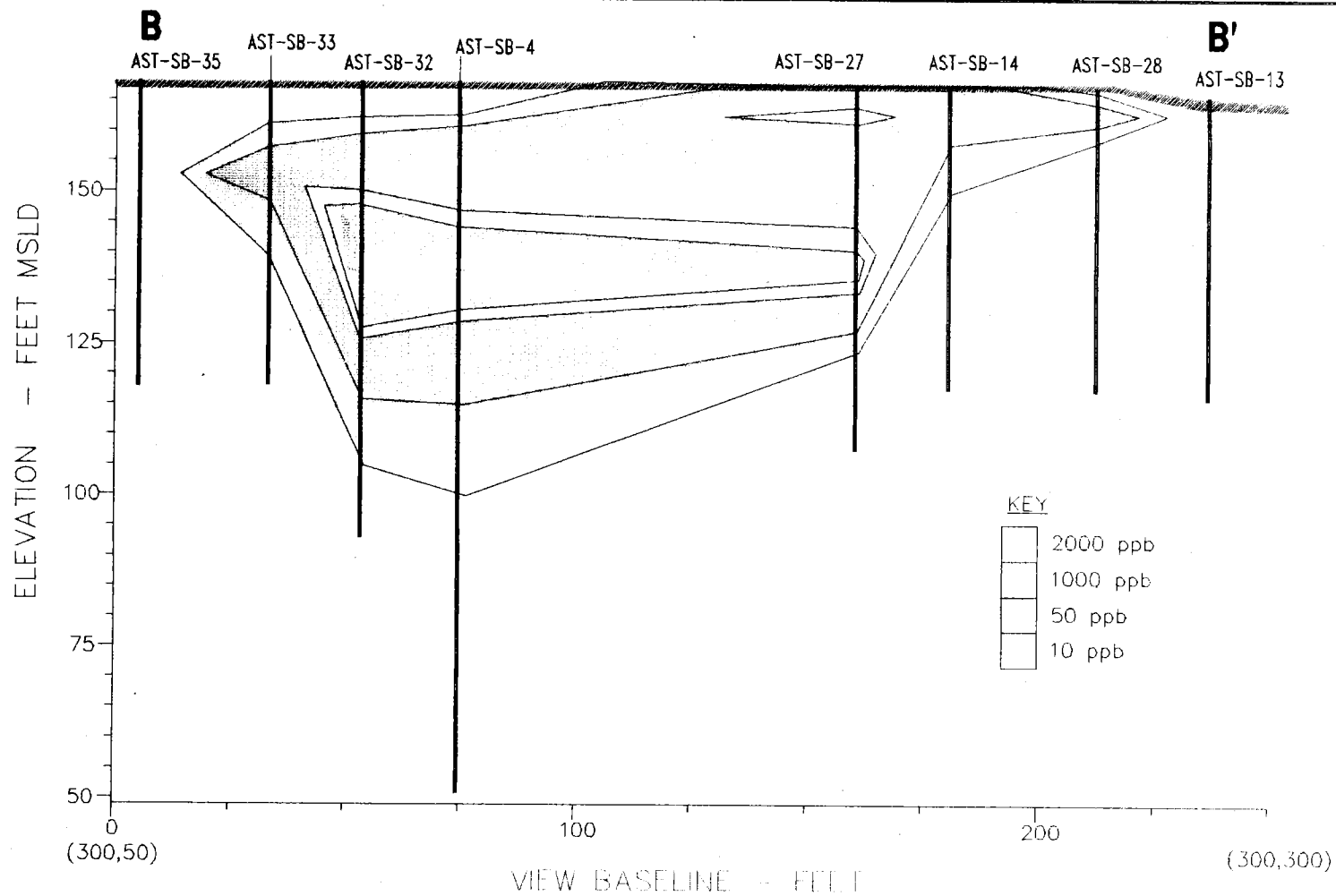
**FIGURE 3-6
CROSS SECTION A - A'**



SITE 2894

**NAS WHITING FIELD
MILTON, FLORIDA**

Milton, Florida



**FIGURE 3-6
CROSS SECTION A - A'**

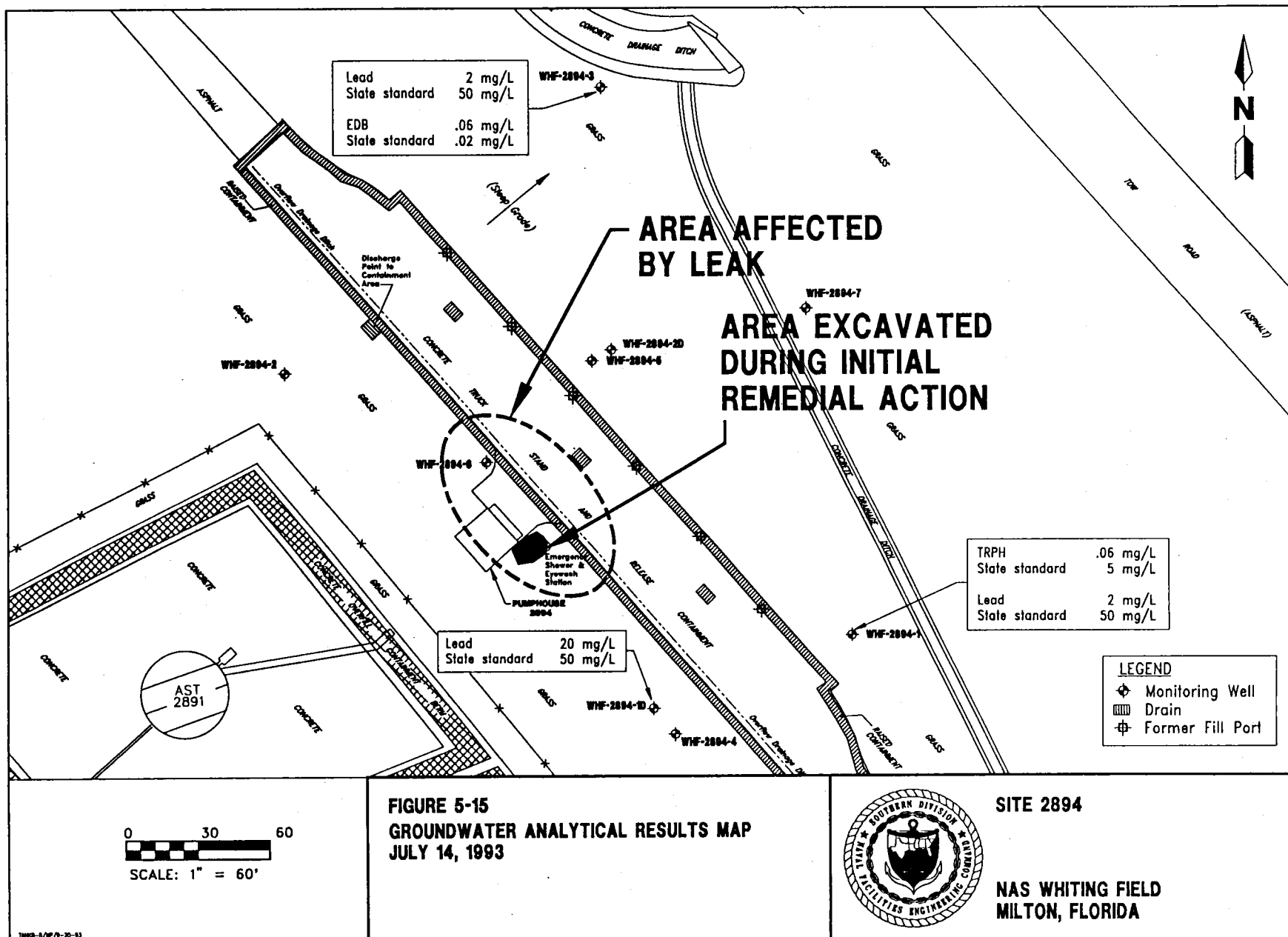


SITE 2894

**NAS WHITING FIELD
MILTON, FLORIDA**

Figure 5-13

C C'



6.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

6.1 SUMMARY. Based on the site history, the data collected during the CA at NAS Whiting Field, and published literature on regional and site conditions, the following conclusions can be made.

- Sediments encountered during drilling operations at the site consist of layers of very fine-to coarse-grained quartz sand, clayey sand, and sandy clay. An intermittent lens of clay approximately 5 feet thick causes perched water conditions about 15 to 20 feet bls. Another, more locally extensive clay layer, is encountered approximately 90 bls and forms an effective aquitard.
- There are two distinct waterbearing zones at the site separated by a 10 to 20 foot thick clay layer at a depth approximately 90 feet bls. Groundwater in the upper waterbearing zone is encountered at depths ranging from 72.58 feet bls to 85.91 feet bls, or surface elevations from 80.39 feet to 83.31 feet above NGVD. Groundwater in the lower waterbearing zone is encountered from approximately 94.58 feet bls to 96.9 feet bls. The clay layer forms an aquitard for the lower waterbearing zone, which is under pressure and has a potentiometric surface elevation ranging from 69.71 feet to 70.75 feet above NGVD.
- Surficial zone groundwater in the vicinity of the site was encountered at depths approximately 85 feet bls and is classified G-II.

- The net groundwater flow direction of the upper waterbearing zone at the site is toward the northeast.
- The direction of groundwater flow in the deep waterbearing zone is to the south-southeast.
- Water level measurements in monitoring well WHF-2894-1D indicates the potentiometric surface of the deep waterbearing zone in this well is 97 feet bls.
- The calculated average hydraulic gradient across the site is 0.0016 ft/ft.
- The calculated average hydraulic conductivity at the site is 9.55 ft/day.
- The calculated average pore water velocity is 0.07 ft/day.
- Organic vapor analyzer (OVA) headspace analysis of soil boring samples indicate the presence of excessively contaminated soil at the site. Excessively contaminated soil extended to a depth of 55 feet bls at the site. The majority of excessively contaminated soil at the site is encountered from ground surface to depths ranging from 25 to 30 feet bls.
- Laboratory results of groundwater samples indicate concentrations of kerosene analytical group compounds were either less than method

detection limits, or detected in concentrations less than State target levels in all wells at the site except WHF-2894-3. In monitoring well WHF-2894-3 EDB was most recently detected at .06 $\mu\text{g}/\ell$ which is above the State target level of .02 $\mu\text{g}/\ell$.

- Three potable public wells are within the 0.50-mile radius of the site and are not likely to be impacted by contamination at the site.

6.2 CONCLUSIONS.

- Past releases of petroleum products from fueling operations at Site 2894 have resulted in excessive soil contamination as defined in Chapter 17-770, FAC.
- Excessively contaminated soils extend to a depth of 55 feet bls.

6.3 RECOMMENDATIONS. Based on the findings and conclusions of this CA, a Remedial Action Plan (RAP) is recommended to clean up excessively contaminated soil at Site 2894. Before preparing a RAP a feasibility study should be completed to determine the viability of different remedial technologies.

7.0 PROFESSIONAL REVIEW CERTIFICATION

The contamination assessment contained in this report was prepared using sound hydrogeologic principles and judgment. This assessment is based on the geologic investigation and associated information detailed in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the assessment described in this report. This Contamination Assessment Report was developed for Site 2891 at the NAS Whiting Field in Milton, Florida, and should not be construed to apply to any other site.

Michael J. Williams

Professional Geologist

P.G. No. 000344

Date

REFERENCES

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Geraghty & Miller, Inc., 1989, AQTESOLV™, Aquifer Test Design and Analysis Computer Software: Version 1.1.

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APPENDIX A

RELEASE AND INITIAL REMEDIAL ACTION DOCUMENTATION

4/5/91

0720 - Sandra Deonne reported discovery of release of fuel @ 62894

0730 - On site for assessment - P/D & Turpene Services on scene - instructed TSP personnel to contain release & clean-up all fuel product
Leak appears to be in 8" fuel line leading from truck discharge to pumps. Location of leak under concrete. Remedial action initiated

- (a) Product removal from pipe
- (b) Pipe flushed twice w/water
- (c) Excavated & removed contaminated soil & placed in vesicular ± 2 CY
- (d) ran new pipe above ground

1530 Notified FDEH by phone - BJBarr

Soil disposed of at Santa Rosa Landfill

Site being evaluated by ABB under Florida Petroleum Contamination Agreement



DEPARTMENT OF THE NAVY

COMMUNICATIONS OFFICER
NAVAL AIR STATION
WHITING FIELD
MILTON, FLORIDA 32570-8000V8
4/11/915090
Ser 18/01

4/12/91

Robert A. Barr, III
Storage Tanks Section Supervisor
Department of Environmental Regulation
160 Governmental Center
Pensacola, FL 32501-5794

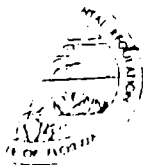
Dear Mr. Barr:

As discussed in the telephone conversation between you and Jim Holland on April 9, 1991, please find the enclosed Discharge Reporting Form with an associated spill incident narrative. Following review of these enclosures, if there are any questions or concerns, please contact Jim Holland, P.E. at 623-7181.

Sincerely,

J. D. MACFARQUHAR
Lieutenant Commander, CEC, U.S. Navy
By direction of the
Commanding Officer

Encl: (1)
Discharge Reporting Form w/attachment



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form #	17-761.500(7)
Form Title	Discharge Reporting Form
Effective Date	December 10, 1990
DER Approval No.	(Filled in by DER)

Discharge Reporting Form

Use this form to notify the Department of Environmental Regulation of:

- Results of tank tightness testing that exceed allowable tolerances within ten days of receipt of test result.
- Petroleum discharges exceeding 25 gallons on pervious surfaces as described in Section 17-761.460 F.A.C. within one working day of discovery.
- Hazardous substance (CERCLA regulated), discharges exceeding applicable reportable quantities established in 17-761.460(2) F.A.C., within one working day of the discovery.
- Within one working day of discovery of suspected releases confirmed by: (a) released regulated substances or pollutants discovered in the surrounding area, (b) unusual and unexplained storage system operating conditions, (c) monitoring results from a leak detection method or from a tank closure assessment that indicate a release may have occurred, or (d) manual tank gauging results for tanks of 550 gallons or less, exceeding ten gallons per weekly test or five gallons averaged over four consecutive weekly tests.

Mail to the DER District Office in your area listed on the reverse side of this form

PLEASE PRINT OR TYPE
Complete all applicable blanks

- DER Facility ID Number: _____ 2. Tank Number: 2891/2892 3. Date: 4/8/91
- Facility Name: NAS WHITING FIELD
Facility Owner or Operator: COMMANDING OFFICER
Facility Address: PUBLIC WORKS DEPARTMENT, NAS WHITING FIELD, MILTON, FL
Telephone Number: (904) 623-7181 County: SANTA ROSA
Mailing Address: SAME
- Date of receipt of test results or discovery: 4/5/91 month/day/year
- Method of initial discovery. (circle one only)
A. Liquid detector (automatic or manual) B. Vapor detector (automatic or manual) C. Tightness test (underground tanks only).
D. Emptying and Inspection. E. Inventory control. **F. Vapor or visible signs of a discharge in the vicinity.** G. Closure: _____ (explain)
H. Other: 1
- Estimated number of gallons discharged: ± 25
- What part of storage system has leaked? (circle all that apply) A. Dispenser **B. Pipe** C. Fitting D. Tank E. Unknown
- Type of regulated substance discharged. (circle one)
A. leaded gasoline B. unleaded gasoline C. gasohol D. vehicular diesel E. aviation gas **G. jet fuel** L. used/waste oil M. diesel Q. new/lube oil V. hazardous substance includes pesticides, ammonia, chlorine and derivatives (write in name or Chemical Abstract Service CAS number) _____ Z. other (write in name) _____
- Cause of leak. (circle all that apply)
A. Unknown B. Split C. Loose connection D. Corrosion E. Puncture F. Installation failure G. Spill H. Overfill I. Other (specify) _____
- Type of financial responsibility. (circle one)
A. Third party insurance provided by the state insurance contractor B. Self-insurance pursuant to Chapter 17-769.500 F.A.C. C. Not applicable D. None
- To the best of my knowledge and belief all information submitted on this form is true, accurate, and complete.

Printed Name of Owner, Operator or Authorized Representative

Signature of Owner, Operator or Authorized Representative

Northwest District
160 Government Center
Tallahassee, Florida 32301-5784

Northwest District
7825 Rembrandt Way, Suite B 200
Jacksonville, Florida 32207

Central District
3319 Mayaguez Blvd, Suite 232
Orlando, Florida 32803-3787

Southwest District
1520 Glenview Blvd
Tampa, Florida 33610-7341

South District
2768 Bay St
Fort Myers, Florida 33901-2806

Southeast District
1900 S. Congress Ave, Suite A
Anna Maria, Florida 33408

FRANK ROWELL, Director
Road & Bridge Dept.
1095 Old Bagdad Hwy.
826-0191-994-5721

TONY GOMILLION, Director
Solid Waste/Mosquito Control/Environmental Control
1095 Old Bagdad Hwy.
826-0191-994-5721

LARRY STANHOPE
Director of Public Works
1095 Old Bagdad Hwy.
826-0191-994-5721
FAX 994-6445

JAMES P. STEWART, Director
Building Maintenance/Parks/Animal Control
P. O. Box 864
823-1568-939-1877

DEVANN COOK, Director
Safety
1095 Old Bagdad Hwy.
826-0191-994-5721

June 3, 1991

Mr. Jim Holland
Public Works
NAS Whiting Field
Milton, FL 32570

Dear Jim:

As discussed during our phone conversation, we can accept the three cubic yards of fuel-contaminated soil for disposal at Central Landfill. Please have the hauler identify it as SPW #49. As discussed, the charge for disposal is \$50 per ton with a minimum charge of \$75. If you do not have an account with our landfill, you will need to pay by cash or check. Call the landfill two hours prior to delivery at phone number 623-9843.

Sincerely,

Tony M. Gomillion (L.H.)

Tony M. Gomillion, Director
Solid Waste & Mosquito Control

TMG/dd

SPECIAL WASTE LOG SHEET

Anticipated Delivery Date: _____

SPW #: 49Responsible Company & Phone: Whiting Field Public Works Dept (623-7181) *Jim Holland*

Anticipated Volume: _____

Special Instructions: fuel Contaminated Soil

Delivery Date	Quantity	Cummulative Quantity
6-11-91	2 yd.	2 yds

Total Cummulative
Quantity _____

Date Office notified of final delivery _____

SANTA ROSA COUNTY PETROLEUM PROGRAM

Administered by:
 ESCAMBIA COUNTY HEALTH DEPARTMENT
 ENVIRONMENTAL HEALTH SERVICES

1190 West Leonard Street, Suite 2
 Pensacola, Florida 32501



Telephone (904) 444-8990

June 13, 1991

Mr. John Albrecht, Code 11523
 Department of the Navy
 Southern Division
 Naval Facilities Engineering Command
 2155 Eagle Drive
 P.O. Box 10068
 Charleston, SC 29411-0068

Re: NAS Whiting Field
 FAC #578516386

Dear Mr. Albrecht:

On April 23, 1991, this department inspected the above named facility in response to a reported petroleum discharge. We confirmed that a discharge had occurred and we have the following comments to offer.

We feel that a contamination assessment is underway; however, we wish to notify you of our expectations. We expect the United States Navy to proceed to assess and clean up the contamination present at this facility pursuant to Chapter 17-770, Florida Administrative Code (FAC). Specifically, within thirty days you should have begun a Contamination Assessment (CA) as defined in Section 17-770.600(1), FAC (attached). A Contamination Assessment Report and remedial action plan should be prepared on the results of the CA within the time frames found in Chapter 17-770, FAC. Any interagency agreement the United States Navy may have with the Florida Department of Environmental Regulation will supersede the timetables set forth in Chapter 17-770, FAC.

If you have any questions, you may contact Eric Ericson at the letterhead address or telephone number (904)444-8990.

Sincerely,

E. P. Ericson, Supervisor
 Petroleum Tank Section

cc-File

Mr. Bob Barr III
 Mr. G. A. Richmond, P.E.

Post-It brand fax transmittal memo 7671		# of pages > 4
To	Nide Rago	
From	Jim Holland	
Co	ABB Environ	
Dept	Public Works	
Phone	904-623-7181 x49	
Fax	904-577-0742	904-623-7490

APPENDIX B

LITHOLOGIC AND MONITORING WELL COMPLETION LOGS



TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-1	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 2/25/92		COMPLTD: 2/25/92	
METHOD: 4.25 in. HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 117FT.		DPTH TO ∇ 100 FT.	
LOGGED BY: C. Douse		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.8/2	0.0	SAND: Reddish brown to grayish orange, fine- to medium-grained.		SM	POSTHOLE	
10		1.0/2	0.0	SANDY CLAY: Reddish brown to graysih orange, fine- to medium-grained.		CL		
15		1.0/2	0.0	SANDY CLAY: Light red to white to pale yellowish orange, fine- to medium-grained.				
20		1.9/2	0.0	CLAYEY SAND: Light red to white to pale yellowish orange, fine- to medium-grained.		SC		
25		1.2/2	0.0	SAND: White to light to pale yellowish orange, fine- to medium-grained.		SM		
30		1.2/2	0.0					
35		1.5/2	0.0	SAND: White to light red to pale yellowish orange to pinkish gray, fine- to medium-grained.				
40		1.0/2	0.0	SAND: White, fine- to medium-grained.				
45		1.0/2	0.0	SAND: Light red, fine- to medium-grained, trace clay.				
50		1.0/2	0.0	SAND: White, fine- to medium-grained.				
55								

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-1
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/25/92		COMPLTD: 2/25/92
METHOD: 4.25 in. HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 100 FT.	
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.0/2	0.0			SM		
60		1.2/2	0.0	SAND: White to pinkish gray, fine- to medium-grained.				
65		1.3/2	0.0	SAND: White, fine- to coarse-grained.		GM		
70		1.8/2	0.0	SAND: White, fine- to coarse-grained.				
75		1.6/2	0.0	SAND: Pale yellowish brown, light red, grayish orange, moderate pink, fine- to coarse-grained.				
80		1.5/2	0.0					
85		2.0/2	0.0	CLAYEY SAND: Gray to light red to brown, fine- to medium-grained.		SC		
90		2.0/2	0.0	SANDY CLAY: Light red to brown to pale yellowish brown to pinkish gray, fine- to coarse-grained, saturated.		CL		
95		2.0/2	0.0	SANDY CLAY: Light red to brown to pale yellowish brown to pinkish gray, fine- to coarse-grained, saturated.				
100		2.0/2	0.0					
105		2.0/2	G.C.	SANDY CLAY: Light red to brown to pale yellowish brown to pinkish gray, fine- to coarse-grained, saturated.				
110						SM		

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-1	
CLIENT: SOUTHNAVFACENGCOM				PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.			DATE STARTED: 2/25/92		COMPLTD: 2/25/92
METHOD: 4.25 in. HSA		CASE SIZE:		SCREEN INT.:	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 117FT.	
LOGGED BY: C. Douse		WELL DEVELOPMENT DATE:			SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 2									
			2.0/2	G.C.	SAND: Brown to grayish orange to pinkish gray, fine- to medium-grained, saturated.		SM		
115			2.0/2	G.C.	SAND: Pinkish gray to pinkish orange, fine- to coarse-grained, saturated.		GM		
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-2	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 2/26/92		COMPLTD: 2/26/92	
METHOD: 4.25 in. HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 112FT.		DPTH TO V 97 FT.	
LOGGED BY: C. Douse		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	CLAYEY SAND: Reddish-brown to brown to pinkish gray, fine- to medium-grained.		SC		POSTHOLE
10		1.0/2	0.0					
15		0.8/2	0.0	CLAYEY SAND: Reddish-brown to brown to pinkish gray, fine- to medium-grained.				
20		1.3/2	0.0	SANDY CLAY: Light red to white to pale yellowish brown, fine- to medium-grained, very stiff.				
25		1.6/2	0.0					
30		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.		SM		
35		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.				
40		2.0/2	0.0	SAND: Grayish-orange to pinkish gray to white, fine- to coarse-grained, trace clay, few gravels.		GM		
45		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.		SM		
50		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.				
55						GM		

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-2
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/26/92		COMPLTD: 2/26/92
METHOD: 4.25 in. HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 97 FT.	
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
		1.2/2	0.0		SAND: Light red to reddish brown to grayish orange, fine- to coarse grained, little gravel.		GM		
60		1.0/2	0.0						
65		1.0/2	0.0		SAND: Light red to grayish orange, fine- to coarse-grained, little gravel.				
70		1.0/2	1.0		SAND: Grayish orange to grayish orange to white, fine- to coarse-grained with moderate gravel.				
75		1.3/2	0.0		SAND: Light brown to reddish brown to pinkish orange, fine- to coarse-grained with some gravel.				
80		1.7/2	0.0		SAND: Light red to reddish brown, fine- to coarse-grained, with moderate gravel, moist throughout.				
85		1.8/2	0.0						
90		2.0/2	0.0		SAND: Light red to reddish brown, fine- to coarse-grained with moderate gravel, saturated.				
95		2.0/2	0.0		CLAY: Red to gray to white to brown, fine to medium grained, stiff.		CH		
100		2.0/2	G.C.						
105		2.0/2	G.C.		SAND: Pale yellowish brown to white to pinkish gray, fine- to coarse-grained, saturated.		GM		
110									

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-2
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/26/92		COMPLTD: 2/26/92
METHOD: 4.25 in. HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 97 FT.	
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 2									
			2.0/2	G.C.	SAND: Pink red to light red to grayish orange to grayish orange, fine- to coarse-grained, saturated.	00	GM		
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-3	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 02/26/92		COMPLTD: 02/26/92	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: 167.50 FT.		MONITOR INST.: OVA		TOT DPTH: 117FT.		DPTH TO ∇ 99 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5							SM		
								POSTHOLE	
			1.8/2	200.0	SAND: Brown, fine grained, hard, odor.			6,8,9,8	
10			1.8/2	150.0				3,12,15,14	
15			1.8/2	1000	CLAYEY SAND: Red, dark yellowish orange, grayish orange, very fine-grained, mottled, strong odor.		SC	7,9,13,16	
20			1.8/2	280.0	CLAY: Red, Dark yellowish orange, very pale orange, mottled, some fine-grained, strong odor.		CL	5,6,11,13	
25			1.8/2	1000	SANDY CLAY: Brown, red, stiff, clay lenses, strong odor.		SC	6,9,6,8	
30			2.0/2	450.0	SAND: Red, brown, fine- to medium-grained, odor.		SM	11,9,9,9	
35			1.5/2	32.0	SAND: White, fine- to medium-grained, odor.			6,6,7,7	
40			1.5/2	30.0	SAND: White, fine- to medium-grained, odor.			6,7,7,9	
45			0.8/2	10.0	SAND: White, very fine-grained, silt, clay, less odor, damp.			5,6,8,8	
50			1.0/2	1.0	SAND: White, fine- to medium-grained.			-,-,8,10	
55							GM		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-3
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 02/26/92	COMPLTD: 02/26/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 167.50 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO V 99 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.5/2	8.0	SAND: White, medium- to coarse-grained, quartz pebbles.		GM	-,-,12,16	
60		1.0/2	14.0	SAND: White, medium-grained.		SP	10,12,15,16	
65		1.2/2	6.0	SAND: Coarse- to very coarse-grained, quartz pebbles.		GP	12,16,18,18	
70		1.5/2	2.0	SAND: Light grayish orange, fine- to medium-grained.		SM	-,-,22,30	
75		1.6/2	2.0	SAND: Grayish orange and moderate pink, fine- to medium-grained, clayey sand lenses.			-,12,13,22	
80		1.0/2	7.0	SAND: Grayish orange with dark yellowish orange stripes, fine-grained, well-sorted.		ML	50,R	
85		1.8/2	0.0	SAND: Brown, very dark red, grayish orange, very fine- to medium-grained, saturated.			Wt. of Rod	
90		2.0/2	0.0	SAND: Fine grained (.5'), wet, stiff clay in remainder of spoon.			5,6,8,7	
95		2.0/2	0.0	CLAY: Purple, stiff.		CL	-,10,12,12	
100		2.0/2	0.0	CLAY: Brown, white, very stiff.			-,13,14,18	
105		2.0/2	1.0	CLAY: Brown, white, very stiff.			-,28,34,35	
110						SC		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-3
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 02/26/92	COMPLTD: 02/26/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 167.50 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 99 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 2								
		2.0/2	7.0	SAND: Brown, wet, 2" clay lens.		SC	-28,34,35	
115		2.0/2	0.0				6,5,6,6	
120								
125								
130								
135								
140								
145								
150								
155				SAND: Fine grained, well-sorted, saturated.				
160								
165								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-4	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 3/01/92		COMPLTD: 3/01/92	
METHOD: 4.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: 168.00 FT.		MONITOR INST.: OVA		TOT DPTH: 117 FT.		DPTH TO ∇ 108 FT.	
LOGGED BY: C. Douse		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.3/2	0.0	SANDY CLAY: Reddish brown to moderate pink to white fine- to medium-grained.		CL		POSTHOLE
10		1.7/2	100.0	SAND: Olive gray to dark yellowish orange, fine- to medium-grained, trace clay.		SM		
15		1.5/2	350.0	SAND: Brown to red to dark yellowish orange, fine- to medium-grained, trace clay.		CH		
20		2.0/2	500.0	CLAY: Light red to white to brown to purple, stiff, slight odor detected.		SM		
25		2.0/2	2000	SAND: Light red to white to brown, fine- to medium-grained, trace clay, slight odor detected.		GM		
30		2.0/2	2000	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, slight odor detected.		SM		
35		2.0/2	2000	SAND: Pinkish gray to white fine- to medium-grained. Slight odor detected.		ML		
40		2.0/2	2000			SC		
45		2.0/2	60.0	SAND: White to pinkish gray to grayish orange, fine-grained, some silt, odor detected.		GM		
50		2.0/2	200.0	CLAYEY SAND: Pinkish gray to grayish orange to gray, fine-grained, slight odor detected.				
55								

TITLE: NAS Whiting Field				LOG of WELL:				BORING NO. AST-SB-4			
CLIENT: SOUTHNAVFACENGCOM								PROJECT NO: 7518-30			
CONTRACTOR: Groundwater Protection Inc.						DATE STARTED: 3/01/92				COMPLTD: 3/01/92	
METHOD: 4.25" HSA				CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D			
TOC ELEV.: 168.00 FT.				MONITOR INST.: OVA		TOT DPTH: 117FT.		DPTH TO ∇ 108 FT.			
LOGGED BY: C. Douse				WELL DEVELOPMENT DATE:				SITE: 2894			

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
			1.3/2	80.0	SAND: White to pinkish gray to grayish orange, fine- to coarse-grained with some gravel.		GM		
60			1.3/2	20.0					
65			1.1/2	14.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained, some gravel.		SM		
70			1.1/2	15.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained, some gravel.				
75			1.1/2	6.0	SAND: Brown to pinkish gray to white, fine- to medium-grained.				
80			1.0/2	0.0	SAND: pale yellowish brown to pinkish gray to white, fine- to medium-grained.				
85			1.5/2	N.M.	SAND: Purple to brown to dark yellowish orange, fine- to medium-grained, wet.		GM		
90			1.8/2	5.0	CLAY: Gray to brown to pinkish gray, fine- to medium-grained, stiff.		CH		
95			2.0/2	0.0					
100			2.0/2	3.0	CLAY: Gray to brown to pinkish gray, fine- to medium-grained, stiff.				
105			2.0/2	N.M.	CLAY: Gray to brown to pinkish gray, fine- to medium-grained, stiff.				
110							SM		

PAGE 2 of ASTSB4
ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-4	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 3/01/92		COMPLTD: 3/01/92	
METHOD: 4.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: 168.00 FT.		MONITOR INST.: OVA		TOT DPTH: 117FT.		DPTH TO ∇ 108 FT.	
LOGGED BY: C. Douse		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 2								
		2.0/2	G.C.	SAND: Brown to pinkish gray to white, fine- to medium-grained, saturated.		SM		
115		2.0/2	G.C.	SAND: pinkish gray to grayish orange to brown, fine- to medium-grained, saturated.				
120								
125								
130								
135								
140								
145								
150								
155								
160								
165								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-5	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 3/02/92		COMPLTD: 3/02/92	
METHOD: 4.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 117FT.		DPTH TO ∇ 101 FT.	
LOGGED BY: C. Douse		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	SAND: Olive gray to gray, fine- to medium-grained, trace clay.		SM		POSTHOLE
10		2.0/2	0.0	SANDY CLAY: Reddish brown to grayish orange to pinkish gray, fine- to medium-grained, trace clay.		SC		
15		1.0/2	0.0	SANDY CLAY: Grayish orange to brown to pinkish gray, fine- to medium-grained.				
20		1.2/2	0.0	SAND: Light red to white to pale yellowish brown, fine- to medium-grained.		SM		
25		2.0/2	0.0	SAND: White to Light red to dark yellowish brown to pinkish gray, fine- to medium-grained.				
30		1.7/2	0.0	SAND: Grayish yellow to pinkish gray to white, fine- to medium-grained.				
35		1.3/2	0.0	SAND: Pinkish gray to white, fine- to medium-grained, trace silt.				
40		1.5/2	0.0	SAND: Pinkish gray to grayish orange to gray, fine- to medium-grained, trace clay.				
45		1.5/2	0.0	SAND: Pinkish gray to grayish orange to gray, fine- to medium-grained.				
50		1.5/2	0.0					
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-5
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/02/92	COMPLTD: 3/02/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 101 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
		1.7/2	0.0		SAND: pinkish gray to grayish orange to gray, fine- to medium-grained.		SM		
60		1.6/2	0.0		SAND: White to grayish orange, fine- to medium-grained, some gravels.				
65		1.5/2	0.0						
70		1.5/2	0.0		SAND: White, fine- to medium-grained.				
75		1.8/2	0.0		SAND: pinkish gray to grayish orange to white, fine- to coarse-grained, trace clay.		GM		
80		1.1/2	1.0		SAND: Pinkish to pale yellowish brown to white, fine-grained.		ML		
85		1.1/2	N.M.		SAND: Pinkish red to pale yellowish brown to pinkish gray to grayish orange, fine- to coarse-grained, wet.		GM		
90		2.0/2	0.0		SANDY CLAY: Pinkish gray, to light brown to pale yellowish brown, fine- to medium-grained, moderate amount of clay.		CL		
95		2.0/2	0.0		CLAY: Light red to pale yellowish brown to brown to white, fine- to medium-grained, stiff.		CH		
100		2.0/2	0.0						
105		N/A	N.M.		SANDY CLAY: Brown to dark yellowish orange, to white to pinkish gray, fine- to medium-grained, moderate amount of clay.		CL		
110							GM		

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-6	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 3/03/92		COMPLTD: 3/03/92	
METHOD: 4.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 107 FT.		DPTH TO ∇ 99 FT.	
LOGGED BY: C. Douse		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
							CL		POSTHOLE
5			1.8/2	0.0	SANDY CLAY: Reddish-brown to grayish orange to pinkish gray, fine- to medium-grained.				
10			2.0/2	0.0	SAND: Reddish-brown to pinkish gray, fine- to medium-grained, trace clay.		SM		
15			1.8/2	0.0	CLAY: Light red to brown to pale yellowish brown to white, fine- to medium-grained, stiff.		CH		
20			2.0/2	700.0	SAND: Light red to brown to white, fine- to medium-grained, trace clay, few gravel, noticeable odor detected.		SM		
25			2.0/2	1000	SANDY CLAY: Brown to grayish orange to pinkish grey to white, fine- to medium-grained, noticeable odor detected.		SC		
30			0.8/2	1000	CLAY: Light red to brown to grayish orange to pale yellowish brown, fine- to medium-grained, noticeable odor detected.		CH		
35			1.0/2	280.0	SAND: Grayish orange to pinkish gray to white, fine- to medium-grained, noticeable odor.		SM		
40			1.5/2	11.0	SANDY CLAY: Pinkish gray to grayish orange to white, fine- to medium-grained.		SC		
45			1.0/2	10.0					
50			1.6/2	4.0	SAND: White to pinkish gray, fine- to coarse-grained with some gravel.		GM		
55									

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-6
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/03/92		COMPLTD: 3/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 107FT.	DPTH TO ∇ 99 FT.	
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.9/2	3.0		0000	GM		
60		1.7/2	5.0	SAND: Pinkish gray to grayish orange to light red to white, fine- to medium-grained.	Diagonal lines pattern	SM		
65		1.7/2	6.0	SAND: Pinkish gray to light red to pale yellowish brown, fine- to medium-grained.				
70		1.0/2	1.0	SAND: Pinkish gray to grayish orange, fine- to medium-grained.				
75		1.1/2	5.0	SAND: Moderate red, grayish yellow to pinkish gray to white, fine- to medium-grained.				
80		1.1/2	N.M.	SAND: Moderate red to grayish yellow to pinkish gray, fine- to coarse-grained, few gravel, wet.	0000	GM		
85		2.0/2	0.0	CLAY: Gray to brown to grayish orange to pinkish gray, fine- to medium-grained, stiff.	Horizontal lines pattern	CH		
90		2.0/2	0.0					
95		2.0/2	0.0	CLAY: Gray to brown to grayish orange to pinkish gray, fine- to medium-grained, stiff.				
100		2.0/2	0.0		Diagonal lines pattern	SM		
105		2.0/2	G.C.	SAND: Pinkish gray to grayish orange, fine- to medium-grained, saturated.				
110								

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-7
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/03/92		COMPLTD: 3/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 102FT.	DPTH TO ∇ 100 FT.	
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			1.7/2	0.0	CLAY: Brown to pinkish gray to white, fine- to medium-grained, stiff.		CL		
10			1.9/2	0.0	SANDY CLAY: Reddish brown to pinkish gray, fine- to medium-grained.				
15			1.8/2	0.0	SAND: Grayish orange to brown to pinkish gray, fine- to medium-grained, few gravel.		SM		
20			2/2	0.0	SAND: Very pale orange, white, fine- to medium-grained.				
25			N.R.	N.M.	NO RECOVERY				
30			1.9/2	N.M.	SAND: Very pale orange, white, grayish orange, fine- to medium-grained.				
35			1.1/2	0.0	SAND: Pinkish gray, white, fine- to medium-grained.				
40			1.1/2	1.0	SAND: Pinkish gray, white, fine- to medium-grained.				
45			1.5/2	0.0	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, few gravel.		GM		
50			1.6/2	3.0			SM		
55									

POSTHOLE

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-7
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/03/92	COMPLTD: 3/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 102FT.	DPTH TO ∇ 100 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.7/2	0.0	SAND: White, pale yellowish brown, fine-grained, moist.		SM		
60		1.3/2	0.0	SAND: Brown, pale yellowish brown, fine- to coarse-grained.				
65		1.5/2	0.0					
70		1.3/2	3.0	SAND: White, brown, fine- to medium-grained.				
75		1.9/2	N.M.	SAND: Pinkish gray to moderate orange pink, fine- to coarse-grained.		GM		
80		2.0/2	0.0	CLAY: Red, gray, very pale orange, fine-grained, stiff.		CL		
85		2.0/2	N.M.	CLAY: Very pale orange, gray, grayish orange, white, fine- to medium-grained, stiff.				
90		2.0/2	N.M.	CLAY: Very pale orange, gray, grayish orange, white, fine- to medium-grained, stiff.				
95		2.0/2	G.C.	SAND: Grayish orange, white, very pale orange, fine- to medium-grained, saturated.		SM		
100		2.0/2	G.C.	SAND: Brown, fine- to medium-grained, saturated.				
105								
110								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-8	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 03/03/92		COMPLTD: 03/03/92	
METHOD: 4.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 112FT.		DPTH TO V 98 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2/2	0.0	CLAYEY SAND: Brown, fine-grained, well-sorted, moist.		SC	POSTHOLE	
10		2/2	0.0				6,8,12,9	
15		2/2	6.0	SANDY CLAY: Red to grayish orange to gray.		CL	7,7,9,8	
20		2/2	0.0	CLAY: Gray to grayish orange, stiff.		CH	4,4,4,7	
25		2/2	N/A	SILTY CLAY: Moderate pink to brown, moist.		CL	4,4,5,4	
30		2/2	33.0	SANDY CLAY: Grayish orange to red, very fine-grained, moist, odor detected.			2,2,2,3	
35		2/2	4.0	SAND: White to red, very fine- to coarse-grained.		GM	5,5,7,9	
40		2/2	0.0	SILTY CLAY: Grayish red, moist. SAND: White, medium-grained.		CL	6,9,10,14	
45		2/2	1.0	SILTY SAND: White, very fine-grained, trace clay, moist.		SP	8,9,10,10	
50		2/2	2.0	SAND: White, fine- to medium-grained, well-graded.		ML	7,8,9,9	
55						SM		
						GM		Wt. of Rod

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-8
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/03/92	COMPLTD: 03/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 98 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
		2/2	2.0		SAND: White, fine- to coarse-grained, well-sorted.		GM	15,18,18	
60		1.5/2	0.0					15,17,18,19	
65		1.6/2	6.0					Wt. of Rod	
70		1.5/2	1.0		SAND: White to dark yellowish orange, fine- to coarse-grained.			25,30,26,27	
75		1.2/2	2.0		SAND: White to red, medium- to coarse-grained.	••••	SW	0,22,23,23	
					CLAYEY SAND: Red to white, medium-grained.	----	SC		
80		1.2/2	4.0		SAND: Red to grayish orange, medium to very coarse-grained.		GP	Wt. of Rod	
85		1.5/2	0.0		CLAYEY SAND: Brown, moist.	----	SC	15,18,18,20	
					CLAY: Gray, trace sand.		CH		
90		1.8/2	0.0		CLAY: Gray to red, trace silt.			Wt. of Rod	
95		1.8/2	N/A		CLAY: Purple to gray, stiff.			10,14,16,20	
100		2/2	N/A		CLAY: Grayish orange to red, very stiff.			0,0,24,24	
105		1/2	N/A		SAND: Brown, fine-grained, trace clay, saturated.		ML	Wt. of Rod	
110									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-8	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 03/03/92		COMPLTD: 03/03/92	
METHOD: 4.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 112FT.		DPTH TO V 98 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 2								
		2/2	N/A	SAND: Brown, fine-grained, saturated.		ML	10,10,10,10	
115								
120								
125								
130								
135								
140								
145								
150								
155								
160								
165								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-9	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 03/10/92		COMPLTD: 03/10/92	
METHOD: 4.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 112 FT.		DPTH TO ∇ 102 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2/2	0.0	SANDY CLAY : Brown, saturated.		CL	POSTHOLE	
10		2/2	1.0	CLAYEY SAND : Mottled, red, grayish orange, dark yellowish orange, fine-grained.		SC	2,2,2,6	
15		2/2	1.0	SAND : Gray, Fine-grained, well-sorted, trace clay. SAND : red, medium-grained, well-sorted.		ML	6,9,9,9	
20		2/2	2.0	SAND : Red and grayish orange stripped, medium- to coarse-grained, gravelly.		SW	6,9,9,10	
25		2/2	2.0	SAND : White, medium-grained, well-graded.			6,7,7,8	
30		2/2	2.0	SAND : Very pale orange with red, fine- to medium-grained.		SM	6,6,7,8	
35		2/2	2.0	SAND : Grayish orange and red, medium- to coarse-grained, last 4 inches are gray silt with clay.		SP	8,15,21,22	
40		2/2	1.0	SANDY SILTY CLAY : Moderate pink, gravel < 5 mm., sand, medium-grained.		GM	11,11,9,10	
45		2/2	1.0	SAND : White, fine- to medium-grained, some gravel.			0,0,7,14	
50		2/2	0.0	SAND : White, fine- to medium-grained.		SM	10,12,14,14	
55						GM	14,19,25,23	

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-9	
CLIENT: SOUTHNAVFACENGCOM				PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.			DATE STARTED: 03/10/92		COMPLTD: 03/10/92
METHOD: 4.25" HSA		CASE SIZE:		SCREEN INT.:	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 112FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:			SITE: 2894

DEPTH FT	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
		2/2	1.0		SAND: White, fine- to coarse-grained, poorly-graded.		GM	18,20,23,23	
60		1.5/2	0.0		SAND : Red, dark yellowish orange, very pale orange, stripped, medium- to very coarse-grained, clayey lenses.		SP	0,0,12,12	
65		1.6/2	0.0		SAND : Dark yellowish orange, very fine-grained, well-sorted, damp.		ML	10,12,12,12	
70		1.5/2	0.0		SAND : Very pale orange, dark yellowish orange, medium- to coarse-grained, damp.		SP	22,22,24,29	
75		1.2/2	0.0		SAND : Dark yellowish orange, grayish orange, fine- to coarse-grained, wet.		GM	26,33,33,35	
80		1.2/2	1.0		SAND : dark yslowish orange, grayish orange, medium- to very coarse-grained, saturated.		SP	10,12,14,14	
85		1.5/2	0.0		SAND : Brown, medium- to very coarse-grained, gravelly, saturated.			Wt. of Rod	
90		1.8/2	0.0		SAND : Brown, medium- to very coarse-grained, saturated.			7,12,14,15	
95		1.8/2	6.0		CLAY : Stiff.				
		1.8/2	6.0		SAND : Brown, medium- to coarse-grained, saturated.			8,10,12,12	
100		2/2	3.0		SAND : Brwon, medium- to coarse-grained. Last 6 inches are brown and very pale orange fine sand, saturated.			12,25,35,37	
105		1/2	N/A					REF	
110									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-10	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 03/17/92		COMPLTD: 03/17/92	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 52FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1/2	0.0	SAND: Red to dark yellowish orange to grayish orange, fine- to medium-grained, trace clay.		SM		POSTHOLE
10		1.5/2	0.0	SAND: Reddish brown, fine-grained, trace clay.		ML		6,12,14,20
15		2/2	0.0	SANDY CLAY: Red, fine-grained.		CL		5,6,9,9
20		1.8/2	0.0	SAND: Red to brown, fine-grained, trace clay.		ML		9,10,10,10
25		2/2	0.0	SAND: Brown to moderate pink, very fine-grained with silt and clay.				7,7,7,8
30		1.8/2	1.0	SAND: Red to dark yellowish orange to pinkish gray, very fine-grained with silt and clay.				5,7,7,7
35		1.8/2	0.0	SAND: White to red, very fine-grained, well-sorted, trace silt.				6,7,7,6
40		2/2	0.0	SAND: White, very fine-grained, well-sorted, silty.				5,6,7,8
45		2/2	0.0	SAND: Fine- to medium-grained with <15mm gravel.		GP		9,10,12,15
50		1.8/2	0.0	SAND: Moderate pink to white, very fine-grained, well-sorted, trace silt.		ML		10,10,12,12
55				SAND: Gray, very fine- to medium-grained, well-graded.		SM		12,15,18,18











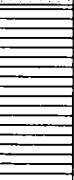

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-11	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 03/17/92		COMPLTD: 03/17/92	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 52FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			1.8/2	25.0	CLAYEY SAND: Brown to red, fine- to medium-grained.		SC		POSTHOLE
10			2/2	0.0	CLAYEY SAND: Brpwn to grayish orange, fine- to medium-grained.				4,7,7,10
15			2/2	0.0	SANDY CLAY: Red to grayish orange to dark yellowish orange, fine- to medium-grained.		CL		5,7,7,7
20			1.8/2	0.0	SAND: White to red, fine-grained, well-sorted.		ML		7,7,9,10
25			1.5/2	0.0	SAND: Moderate pink to white, fine- to medium-grained.		SM		10,12,15,18
30			1.8/2	1.0	SAND: Gray, fine- to medium-grained.				12,15,18,19
35			1.5/2	0.0	SAND: White, very fine-grained, silty.		ML		17,19,25,27
40			1.5/2	0.0					14,12,11,11
45			1.8/2	0.0	SAND: White, fine- to medium-grained, well-graded.		SM		10,12,12,14
50			2/2	0.0	SILTY SAND: White, very fine-grained.		ML		14,16,17,18
55									14,12,12,11

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-12	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 03/19/92		COMPLTD: 03/19/92	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 97FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
							SC		POSTHOLE
5			2/2	0	SAND: Medium-grained, trace clay, dry.				
10			2/2	0	SANDY CLAY: Mottled red / dark yellowish orange / off white, fine-grained.		CL		
15			2/2	0	SILTY CLAY : Mottled, red / dark yellowish orange, off white, fine-grained, some fine sand, stiff.				
20			2/2	0	SILTY CLAY : Very light gray with moderate pink mottling, damp.				
25			2/2	0	SILTY CLAY : Very light gray with moderate pink mottling, damp.				
30			1.8/2	0	SAND : Moderate pink, fine-grained, well-sorted, 2 inch clay zone, moist.		ML		
35			1.6/2	0	SAND : Moderate pink, fine-grained, well-sorted, damp.				
40			1.6/2	0	SAND : Moderate pink, very fine- to fine-grained, trace medium-grained, well-graded.				
45			1.6/2	0	SAND : White with moderate reddish brown stripes, very fine- to medium-grained, well-graded, last 4 inches dry.		SM		
50			2/2	2	SAND : White, very fine- to coarse-grained, well-graded.		GM		
55							ML		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-12
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/19/92	COMPLTD: 03/19/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 97FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
			1.6/2	2	SAND : Very fine- to fine-grained, moderately graded, trace medium-grained.		ML		
60			1.8/2	0	SAND : White, Very fine- to fine-grained, well-graded.				
65			1.8/2	0	SAND : Very fine- to fine-grained, moderately graded, trace medium-grained sand and mica, damp.				
70			1.6/2	0	SAND : Gray with moderate yellow stripes, Very fine- to very coarse-grained, well-graded, predominately coarse and very coarse, small pebbles < 5 mm.		GP		
75			2/2	0	SAND : White with red and moderate orange pink stripes, very coarse- grading to very fine-grained.				
80			2/2	0	SAND : White with moderate orange and pale yellowish brown, medium- to coarse-grained, damp.		SP		
85			2/2	0	SILTY CLAY : Mottled moderate orange pink / yellowish gray, moist.		CL		
90			2/2	0	CLAY : Gray with grayish orange mottling, silty lenses, damp.				
95									
100									
105									
110									

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-13
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/14/93		COMPLTD: 05/14/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: 166.00 FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.	
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0.0	SAND : Dark yellowish orange and olive gray, medium-grained, well-sorted, moist.		SP		POSTHOLE
5			0.9/2	0.0	SAND : Dark yellowish orange and olive gray, medium-grained, well-sorted, some clay, moist.			4,7,7,10	
10			0.9/2	0.0	CLAYEY SAND : Moderate reddish brown, dark yellowish orange and olive gray, mottled, medium-grained, some fines, well-rounded, poorly sorted, dry.		SC	15,6,10,9	
15			1/2	0.0	SILTY SAND : Moderate reddish brown at the top grading to grayish orange, fine- to medium-grained, well-graded, well-rounded, looser with depth.		SM	4,9,10,8	
20			1.2/2	0.0	SAND : Dark yellowish orange and dark yellowish brown, medium-grained, subrounded, poorly sorted, damp.		SW	9,11,14,12	
25			1.8/2	0.0	SILTY SAND : Pale yellowish orange, medium-grained at the top grading to very fine-grained with depth, well-rounded, dense, damp.		SM	10,12,18,16	
30			1.8/2	0.0	SILTY SAND : Mottled moderate red, grayish orange pink, dark yellowish orange, very fine-grained, silty, tray clay, well-rounded, moist.		ML	4,3,7,9	
35			1.8/2	0.0	SILTY SAND : Very pale orange, very fine-grained, well-rounded.			9,8,6,7	
40			1.7/2	0.0	SILTY SAND : Grayish pink, very light gray, very fine-grained, well-sorted, mica, clay lense, moist.			5,6,6,10	
45			1.8/2	0.0	SILTY SAND : Grayish orange pink, fine- to very fine-grained, well-sorted, trace mica, moist.			8,8,9,6	
50									
55									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-14	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/14/93		COMPLTD: 05/14/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: 167.50 FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			0.0	SAND : Medium-grained, large gravel, dense.		SP		POSTHOLE
5		1.9/2	220	SAND : Olive gray, medium-grained, well-sorted, damp.			10,15,18,6	
10		1.8/2	50	CLAYEY SAND : Mottled dark yellow orange, very pale orange, moderate yellowish brown, medium-grained, dense, damp.		SC	2,9,6,13	
15		2/2	25	SANDY CLAY : Mottled dark yellow orange, medium-to fine-grained, dense.		CL	3,8,18,6	
20		2/2	1.0	SANDY SILTY CLAY : Light brown, very pale orange, trace sand and silt, tight, dry.			5,9,11,14	
25		2/2	0.0	CLAYEY SAND : Mottled pale yellowish brown, dark yellowish orange, sand and silty clay, moist.		SC	6,4,6,6	
30		1.9/2	0.0	SAND : Grayish orange, very fine- to medium-grained, well-rounded, well-graded, mica.		SW	5,7,8,8	
35		1.8/2	0.0	SILTY SAND : (0 to 15 in) Dark yellow orange, medium-grained, subrounded, mica, saturated, (15 to 20 in) grayish pink, silty, soft, moist, perched water table.		SM	5,7,4,8	
40		2/2	0.0	SILTY CLAYEY SAND : Grayish pink and moderate reddish brown, very fine-grained, soft, moist.		ML	1,2,6,6	
45		1.8/2	0.0	SAND : Very pale orange, fine- to medium-grained, well-sorted, well-rounded, moist.		SM	12,14,12,14	
50								
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-15	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/14/93		COMPLTD: 05/14/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: 0	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 52FT.		DPTH TO V. FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				1800 SAND : Dark Yellowish brown, medium-grained, dry.		SW		POSTHOLE
10		1.8/2		1000 SAND : Dark yellowish brown, fine- to medium-grained, rounded, trace clay, moist.		SC	3,5,6,7	
15		2/2		50 CLAYEY SAND : (0 to 12 in) Moderate reddish brown, fine-grained, dense, dry, (12 to 24 in), dark reddish brown, fine-grained, loose.			4,8,16,13	
20		0.5/2		80 CLAYEY SAND : (0 to 3 in) Moderate reddish brown, medium-grained, (3 to 6 in), mottled moderate reddish brown, very light gray, dark yellowish orange, clay, tight.			4,7,9,10	
25		1.9/2		2000 SANDY SILTY CLAY : Mottled dark yellowish orange, very pale orange, moderate red, very fine-grained, moist, strong petroleum odor.		CL	2,4,5,5	
30		1.9/2		2500 SANDY SILTY CLAY : Mottled dark yellowish orange, very pale orange, moderate red, very fine-grained, moist, strong petroleum odor.			2,3,2,3	
35		2/2		8 SILTY CLAY : Moderate reddish brown, grayish pink,			1,1,2,1	
40		1.8/2		28 SILTY SAND : Pinkish gray, fine- to medium-grained, well-graded, dry.		SM	9,11,12,15	
45		1.8/2		12 SILTY SAND : Pinkish gray, fine- to medium-grained, well-graded, dry.			10,10,11,9	
50		1.8/2		4 SILTY SAND : Very pale orange, very fine- to medium-grained, subangular pebbles, mica, damp.			7,10,10,12	
55		1.8/2		2 SILTY SAND : Very pale orange, very fine- to medium-grained, subangular, pebbles, mica, damp.			12,12,12,14	

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-16	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/16/93		COMPLTD: 05/16/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 52FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.9/2	1700	SAND : Dark yellowish brown, fine-grained, well-sorted.		SM	3,6,4,5	
10		1.8/2	100	SAND : Dark yellowish brown, pale brown, fine-grained, well-sorted.			12,15,16,10	
15		2/2	18	CLAY : (0 to 12 in), Dark reddish brown, medium-grained, (12 to 24 in), dark yellowish orange, pale yellowish brown, very pale orange, medium- to fine-grained, very stiff, hard.		CH	11,13,11,13	
20		1.8/2	18	SANDY CLAY : Mottled dark yellowish orange, very pale orange, fine-grained, compact.		CL	7,7,9,17	
25		1.8/2	45	SAND : Very pale orange and light brown, very fine- to very coarse-grained, well-graded, angular, gravel 3/4 inch, subrounded, loose.		SW	4,6,10,11	
30		1.7/2	5	SAND : Very pale orange, very fine- to coarse-grained, well-graded, subangular, loose, dry.			7,8,10,13	
35		1.3/2	5	SAND : Very pale orange, very fine- to coarse-grained, well-graded, subangular, loose, dry.			5,7,14,17	
40		1.5/2	5	SILTY SAND : Very pale orange, very fine- to medium-grained, some silt, trace mica, loose, musty odor.		SM	7,11,12,15	
45		1.4/2	2	SILTY SAND : Very pale orange, very fine- to medium-grained, some silt, trace mica, loose, musty odor.			9,9,7,12	
50		1.8/2	2	SILTY SAND : Very pale orange, fine- to medium-grained, mica, loose.			12,12,16,21	
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-17	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/16/93		COMPLTD: 05/16/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0 SAND : Dark yellowish orange, fine- to medium-grained, trace clay.		SP		
5		0.2/2		0 SAND : Dark yellowish orange, fine- to medium-grained, trace clay.			3,10,17,16	
10		1.8/2		1 SANDY CLAY : Mottled, very pale orange, moderate reddish brown, dark yellowish orange, fine-grained, hard, dry.		CL	5,9,14,18	
15		1.9/2		1 SAND : Moderate reddish brown, very pale orange, fine-grained, well-sorted, well-rounded, mica, some clay.		SM	6,6,7,8	
20		1.3/2		2 SAND : Moderate reddish brown, very pale orange, fine- to coarse-grained, well-graded, angular, gravel < 5mm, dry.		GM	12,8,8,8	
25		1/2		2 SAND : Very pale orange, very fine- to medium-grained well-graded, rounded, dry.		SM	8,11,11,11	
30		1/2		3 SAND : Very pale orange, medium-grained, well-sorted, rounded, mica, clay lenses.		SP	7,7,9,13	
35		1.5/2		2 SAND : Very pale orange, fine-grained, well-rounded, well-sorted, trace clay lenses, mica, dry.		SM	5,6,11,11	
40		1.5/2		2 SAND : Very pale orange, very fine- to medium-grained, rounded, mica, trace clay, dry.			6,12,13,15	
45		1.5/2		5 SAND : Very pale orange, fine- to medium-grained, subrounded, mica, loose, dry.			9,8,8,8	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-18
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/17/93		COMPLTD: 05/20/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: 158.80 FT.	MONITOR INST.: OVA	TOT DPTH: 83FT.	DPTH TO ∇ FT.	
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
3					CLAYEY SAND : Moderate reddish brown, fine- to medium-grained, moist.		SC		
5			1.5/2	0	SANDY CLAY : Very pale orange, dark yellowish brown, mottled, moderate reddish brown, fine-grained, hard, dry.		CL	4,8,12,17	
10			1.4/2	2	CLAYEY SAND : Moderate to reddish brown, medium- to very coarse-grained, gravel, angular, loose.		SC	10,9,15,11	
15			1.9/2	0	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist.		CL	10,7,7,6	
20			1.6/2	21	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist.			1,1,2,1	
25			2/2	15	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist, petroleum odor.			5,9,8,7	
30			2/2	4	SAND : Pale yellowish orange, fine-grained, poorly-sorted, rounded.		ML	4,8,10,12	
35			0.7/2	4	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, dry.			7,8,9,9	
40			1.6/2	2	SAND : Very pale orange, very fine-grained, well-sorted, well-rounded, dry.			7,8,11,9	
45			1.4/2	2	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, dry.			13,16,17,16	
50			1.5/2	8	SAND : Very pale orange, medium- to coarse-grained, poorly-graded, gravel, mica.		SP	9,12,16,16	
55							ML		

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-18
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/17/93		COMPLTD: 05/20/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: 158.80 FT.	MONITOR INST.: OVA	TOT DPTH: 83FT.	DPTH TO ∇ FT.	
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
		1.7/2	1		SAND : Very pale orange, fine-grained, well-rounded, loose, mica, dry.		ML	11,15,18,15	
60		1.8/2	1		SAND : Very pale orange, fine- to medium-grained, well-graded, subrounded, damp.		SM	10,14,25,29	
65		1.7/2	4		SAND : Very pale orange, fine- to medium-grained, subrounded, well-graded, mica, damp.			14,34,29,32	
70		1.6/2	0		SAND : Very pale orange, pale yellowish orange, medium-grained, subrounded, well-sorted, mica, damp.			6,11,29,40	
75		1.5/2	1		SAND : Grayish orange, medium-grained, some fines, subrounded.		SP	11,23,32,35	
		1.6/2	SAT		SAND : Dark yellowish orange, medium-grained, subrounded, moist.		SM	19,24,35,40	
80		2/2	SAT		SAND : Medium-grained graded to very coarse-grained, angular, saturated.		GP	22,23,24,29	
		2/2	SAT		SAND : Dusky red, coarse- to very coarse-grained, angular, saturated.			14,20,18,9	
85									
90									
95									
100									
105									
110									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-19	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/17/93		COMPLTD: 05/17/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 42FT.		DPTH TO V. FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			0	SAND : Medium-grained, damp.		SP		
5		1/2	0	CLAYEY SAND : Very pale orange, moderate reddish brown, light brown, medium-grained, subrounded, moist.		SC	2,3,8,9	
10		1.6/2	0	CLAYEY SAND : Mottled very pale orange, moderate reddish brown pale yellowish orange, fine-grained, subrounded, densely compacted.			3,8,10,12	
15		1.8/2	0	CLAY : mottled moderate reddish brown, very pale orange, dark yellowish orange, fine-grained, hard, dry.		CL	3,10,11,10	
20		2/2	0	SILTY CLAY : Pale red, moderate reddish brown, soft.			2,4,3,4	
25		1.5/2	0	SAND : Very pale orange, moderate reddish brown, light brown, fine-grained, rounded, loose.		SP	5,10,9,7	
30		1.8/2	0	CLAYEY SAND : Moderate reddish brown, dark yellowish orange, fine-grained, rounded, saturated.		SC	3,2,2,4	
35		2/2	0	SANDY CLAY : Moderate reddish brown, very pale orange, fine-grained, moist.		CL	1	
40		1.8/2	0	SAND : Very pale orange, fine- to medium-grained, rounded, mica, loose.		SM	9,11,11,11	
45								
50								
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-20	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/17/93		COMPLTD: 05/17/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate brown, fine- to medium-grained, rounded, trace clay.		SM		
5		1.5/2	0	CLAYEY SAND : Grayish orange, litht brown, fine- to medium-grained, well-rounded, gravel < 5mm.		SC	4,5,4,8	
10		1.9/2	0	CLAYEY SAND : Moderate red, grayish orange, fine-grained.			6,8,10,8	
15		1.8/2	0	SAND : Dark yellowish orange, very pale orange, grayish orange pink, very fine-grained, silty, well-rounded.		ML	4,7,8,8	
20		1.8/2	0	SILTY CLAY : Pale reddish brown, very pale orange, soft.		CL	4,4,6,7	
25		2/2	0	SANDY CLAY : Dusty red, pale reddish brown, medium-grained, well-rounded, soft, sand lenses.			2,4,6,5	
30		1.8/2	0	SILTY CLAY : Very pale orange, moderate reddish brown, dark yellowish orange, soft, moist.			5,3,4,5	
35		2/2	0	SILTY CLAY : very pale orange, moderate orange pink, soft, moist.			2,1,2,4	
40		2/2	0	SAND : (0 to 8 in) Sand, moderate red, medium grained, subrounded, saturated. (8 to 14 in) Silty clay, very pale orange, soft, moist. (14 to 24 in) Sand, very pale orange, moderate reddish brown, medium-grained, gravel, damp.		SP	7,9,10,9	
45		1.8/2	0	SAND : very pale orange, fine- to medium-grained, dry.		SM	7,10,10,9	
50								
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-21	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/17/93		COMPLTD: 05/17/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0			0			SC		
5		1/2	0	CLAYEY SAND : Mottled, moderate reddish brown, very pale orange, pale yellowish orange, fine-grained, hard, dry.			3,7,11,20	
10		1.2/2	0	SANDY CLAY : Mottled very pale orange, light brown, fine-grained, inelastic.		CL	4,8,11,15	
15		1.5/2	3	SAND : Very pale orange, dusty red, fine-grained, poorly-sorted, subrounded, gravel, dry.		ML	4,8,7,9	
20		1.4/2	3	SAND : Very pale orange, light red, fine- to medium-grained, subangular, loose, dry.		SM	6,8,6,9	
25		1.5/2	2	SAND : Very pale orange, medium-grained, well-sorted, subrounded, mica, dry.		SP	5,7,8,12	
30		1.5/2	3	SAND : Very pale orange, medium-grained, well-sorted, subrounded, mica, dry.			7,12,8,12	
35		1.7/2	1	SILTY SAND : Very pale orange, very fine-grained, rounded, mica, clay lenses, dry.		ML	4,6,7,12	
40		1.6/2	2	SILTY SAND : Very pale orange, fine-grained, rounded, mica, dry.			6,6,12,13	
45		1/2	0	SAND : Very pale orange, medium-grained, rounded, mica, dry.		SP	9,14,16,20	
50								
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-22	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/18/93		COMPLTD: 05/18/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: 0	
TOC ELEV.: 158.80 FT.		MONITOR INST.: OVA		TOT DPTH: 67FT.		DPTH TO V FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate yellowish brown, fine- to medium-grained, some clay, moist.		SC		
5		2/2	0	CLAYEY SAND : Mottled, moderate reddish brown, grayish orange pink, dark yellowish orange, fine- to medium-grained, densely compacted, dry.			8,9,10,20	
10		2/2	0	CLAY : Mottled moderate reddish brown, very pale orange, dark yellowish orange, some fine sand, hard, inelastic, dry.		CL	5,7,12,15	
15		2/2	0	SILTY CLAY : Pale yellowish orange, dark yellowish orange, light brown, soft inelastic, damp.			4,5,7,6	
20		2/2	2400	SILTY CLAY : Moderate reddish brown, very pale orange, soft, inelastic, soft, moist.			2,3,3,5	
25		2/2	1400	SAND : Coloring stratified, dusky red, very pale orange, dark, yellowish orange, fine- to medium-grained, sorted, subangular, loose, petroleum odor.		SM	5,8,9,14	
30		2/2	50	SAND : Very pale orange, medium- to coarse-grained, subangular, large gravel, rounded, 10 - 15 mm.		SP	6,12,14,15	
35		1.5/2	100	SILTY SAND : Very pale orange, very fine-grained, soft, rounded, clay lenses, mica.		ML	6,8,13,4	
40		1.5/2	10	SILTY CLAY : Grayish orange pink, soft, mica, moist.		CL	5,4,6,8	
45		1/2	7	SAND : Grayish orange pink, medium-grained, well-sorted, subrounded, mica, damp.		SP	9,17,20,20	
50		1.5/2	9	SAND : Grayish orange pink, medium-grained, well-sorted, subrounded, loose , gravel.			8,14,15,16	
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-22
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/18/93	COMPLTD: 05/18/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 158.80 FT.	MONITOR INST.: OVA	TOT DPTH: 67FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
			1.5/2	15	SAND : Very pale orange, medium- to coarse-grained, poorly graded, subangular, loose.		SP	10,16,19,20	
60			1.5/2	4	SILTY SAND : Very pale orange, fine-grained, well-rounded, loose, mica.		SM	14,25,29,40	
65			1.5/2	1	SAND : Very pale orange, medium-grained, subrounded, mica, dry.			8,12,23,27	
70									
75									
80									
85									
90									
95									
100									
105									
110									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-23	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/18/93		COMPLTD: 05/18/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 57FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Light brown, medium-grained, trace clay, damp.		SC		
5		1.5/2		CLAYEY SAND : Moderate reddish brown, dark yellowish orange, very pale orange, fine-grained, hard.			5,11,13,18	
10		1.5/2		SAND : Dusky red, medium- to coarse-grained, loose, dry.		SP	8,14,9,11	
				CLAY : Dark brown, hardpan.		CL		
15		1.5/2		SILTY CLAY : very pale orange, pale yellowish orange, hard, inelastic.			3,5,5,6	
				SILTY CLAY : Very pale orange, moderate reddish brown, soft, inelastic.				
20		1.7/2	80	SILTY CLAY : Moderate reddish brown, very pale orange, soft, moist.			1,2,2,1	
25		2/2	3	SILTY CLAY : Very pale orange, moderate red, soft, inelastic.			3,3,3,4	
				CLAY : Light red, soft, elastic.				
30		1.6/2	8	SAND : Very pale orange, fine- to medium-grained, poorly-graded, mica, dry.		SM	7,7,12,10	
35		1.5/2	3	SILTY SAND : Very light gray, very fine-grained, rounded, clay lenses, mica.		ML	5,6,7,7	
40		1.5/2	4	SILTY SAND : Very light gray, very fine-grained, rounded, mica, clay lenses.			4,8,8,10	
45		1.7/2	11	SAND : Very light gray, medium-grained, rounded, loose, mica.		SP	12,18,20,17	
50		1.4/2	5	SAND : Very pale orange, medium-grained, subrounded, loose, mica.			8,14,22,20	





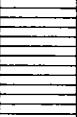

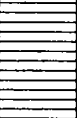
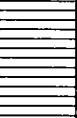

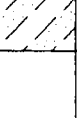
TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-23
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/18/93	COMPLTD: 05/18/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: 0
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 57FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS Continued from PAGE 1	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			1.5/2	0	SAND : Moderate reddish brown, very pale orange, medium- to coarse-grained, rounded, poorly graded, loose.		SP	10,19,21,28	
60									
65									
70									
75									
80									
85									
90									
95									
100									
105									
110									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-24	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/18/93		COMPLTD: 05/18/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 52FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0					SAND : Dark yellowish brown, fine- to medium-grained, trace clay, damp.		SM		
5			1.5/2	0	CLAYEY SAND : Moderate reddish brown, very pale orange, light brown, very fine-grained, rounded, compact.		CL	4,9,18,27	
10			2/2	0	SILTY CLAY : Mottled moderate reddish brown, light gray, inelastic, hard.			6,10,12,12	
15			1.7/2	0	SILTY SAND : Moderate orange pink, fine-grained, poorly-sorted.		ML	5,7,6,8	
20			1.5/2	2	SILTY SAND : Light gray, fine-grained, rounded, poorly-sorted, gravel, < 5 mm.		SP	4,6,6,7	
25			0.7/2	0	SAND : Very pale orange, fine- to medium-grained, poorly-sorted, rounded, loose, gravel.		SM	4,7,9,10	
30			1.6/2	4	SAND : Very pale orange, fine-grained, subrounded, loose, mica.		ML	6,10,11,15	
35			1.5/2		SILTY SAND : Very pale orange, grayish pink, very fine-grained, clay lenses, mica, rounded.			4,5,11,15	
40			2/2	3	SAND : Very pale orange, very fine- to coarse-grained, poorly-graded, gravel, mica.		GM	6,7,7,14	
45			1.7/2	2	SAND : Grayish orange pink, medium-grained, subrounded, loose, mica.		SM	10,10,12,16	
50			1.5/2	3	SAND : Dusky red, very pale orange, medium-grained, subangular, loose.			7,15,14,15	
55									

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-25
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/18/93		COMPLTD: 05/18/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.	
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				0	SAND : Dark yellowish brown, fine- to medium-grained, trace clay, damp.		SM		
5			2/2	0	CLAYEY SAND : Mottled moderate reddish brown, very pale orange, dark yellowish brown, fine-grained, rounded, compact, dry.		SC	13,15,16,16	
10			2/2	0	SILTY SAND : Mottled very pale orange, pale yellowish orange, dark yellowish brown, fine-grained, rounded, compact, dry.		ML	7,13,15,12	
15			2/2	0	SANDY CLAY : Moderate red, fine-grained, inelastic. CLAY : Very pale orange, pale red, inelastic, hard.		CL	7,4,7,8	
20			2/2	0	SILTY CLAY : Very pale orange, moderate red, soft, moist.			2,2,2,3	
25			2/2	0	SILTY SAND : Dark yellowish orange, moderate red, very pale orange, very fine grained, clay lense, soft, moist.		ML	4,5,4,7	
30			2/2	0	SILTY CLAY : Very pale orange, moderate reddish brown, trace very fine sand, soft, saturated.		CL	1,1,3,6	
35			1.5/2	1	SILTY CLAY : Very pale orange, moderate reddish brown, trace very fine sand, soft, saturated.			5,14,16,14	
40			1.2/2	1	SAND : Light gray, medium- to coarse-grained, angular, dry. SAND : Grayish pink, fine-grained, well-rounded, well-sorted, mica, clay-lense.		ML	12,13,16,16	
45			1.5/2	3	SAND : Grayish pink, fine-grained, well-rounded, well-sorted, mica.			9,19,24,27	
50									
55									

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-26	
CLIENT: SOUTHNAVFACENGCOM				PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.			DATE STARTED: 05/19/93		COMPLTD: 05/19/93
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 52FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:		SITE: 2894	
PROTECTION LEVEL: D					

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				5	SAND : Grayish brown, fine- to medium-grained, trace clay moist.		SM		
5			2/2	5	CLAYEY SAND : light brown, fine-grained, well-rounded, damp.		SC	5,3,4,5	
10			2/2	0	CLAYEY SAND : Moderate reddish brown, very pale orange, fine-grained, well-rounded, hard.			5,6,7,14	
15			1.7/2	0	SILTY SAND : Moderate reddish brown, very pale orange, very fine-grained, trace clay.		ML	9,9,6,7	
20			2/2	0	SILTY CLAY : Pale yellowish orange, soft, inelastic, damp.		CL	3,4,3,3	
25			2/2	2	SILTY SAND : Stratified color, dusky red, pale yellowish orange, very fine-grained, rounded, clay senses, mica, damp.		ML	8,7,5,8	
30			1.8/2	0	SILTY SAND : Very pale orange, fine-grained, rounded, nearly saturated.			4,5,7,6	
35			2/2	0	SILTY CLAY : Moderate orange pink, moderate reddish brown, soft, inelastic, moist.		CL	1,2,4,18	
40			2/2	3	SILTY SAND : Grayish orange pink, very fine-grained, rounded, mica.		ML	10,10,14,14	
45			2/2	1	SILTY SAND : Very pale orange, very fine-grained, rounded, mica.			9,8,8,12	
50			1.8/2	0	SAND : Very pale orange, medium-grained, well-sorted, subrounded, loose, mica.		SP	12,12,15,22	
55									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-27	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/19/93		COMPLTD: 05/19/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: 167.50 FT.		MONITOR INST.: OVA		TOT DPTH: 57FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			200	SAND : Dark yellowish brown, fine-grained, rounded, moist.		ML		
10		1.7/2	1000	SAND : Olive gray, fine-grained, rounded, wood fragments, possibly roots, moist.			5,8,11,11	
15		2/2	140	CLAYEY SAND : Moderate yellowish brown, very pale orange, fine- to medium-grained, rounded.		SC	9,7,9,7	
20		1.7/2	36	CLAYEY SAND : Moderate reddish brown, very pale orange, fine-grained, compact dry.			6,5,7,13	
25		1.7/2	15	CLAYEY SAND : Pale yellowish orange, moderate red, very pale orange, very fine-grained, soft, silt, moist.			4,6,7,10	
30		1.7/2	1900	SILTY CLAY : Grayish pink, Grayish yellow, soft, moist.		CL	3,6,4,4	
35		1.7/2	2000	SILTY SAND : Moderate red, very pale orange, light brown, very fine-grained, clay lenses, soft, moist.		ML	5,4,7,7	
40		1.7/2	SAT	SILTY SAND : Very pale orange, moderate red, very fine-grained, well-rounded, mica, saturated.			2,3,3,3	
45		1.9/2	70	SILTY CLAY : (0 to 18 in.) Moderate orange pink, soft, moist, (18 to 22 in.) coarse-grained, angular, gravel 5 mm, poorly sorted.		CL	9,13,15,18	
50		1.9/2	6	SILTY SAND : Very pale orange, very fine-grained, well-rounded, well-sorted, mica, dense.		ML	6,7,9,12	
55		2/2	8	SILTY SAND : Light gray, fine-grained, rounded, mica.			8,14,13,15	
						SP		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-27
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/19/93	COMPLTD: 05/19/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 167.50 FT.	MONITOR INST.: OVA	TOT DPTH: 57FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
			2/2	5	SAND : Very pale orange, medium-grained, mica, loose, slough is saturated.		SP	7,23,26,23	
60									
65									
70									
75									
80									
85									
90									
95									
100									
105									
110									



TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-28	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/19/93		COMPLTD: 05/19/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: 167.20 FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				SAND : Dark yellowish brown, fine- To medium-grained, subrounded, loose, moist.		SM		
5		1.5/2	80	SAND : Dark yellowish brown, fine-grained, rounded, moist.		ML	9,5,4,4	
10		1.5/2	8	CLAYEY SAND : Moderate reddish brown, fine-grained, damp.		SC	4,4,6,8	
15		1.8/2	5	CLAYEY SAND : Moderate reddish brown, very pale orange, fine-grained, compact, dry.			4,7,11,15	
20		1/2	4	SILTY CLAY : Pale yellowish orange, light brown, soft, damp.		CL	4,5,6,6	
25		1.5/2	0	SILTY CLAY : Dusky red, very pale orange, pale yellowish orange, soft, inelastic, damp.			1,2,2,4	
30		2/2	0	SILTY SAND : Very pale orange, pale yellowish orange, very fine-grained, rounded, mica.		ML	2,5,6,6	
35		2/2	SAT	SILTY SAND : Grayish orange pink, rounded, mica, satruated, 4 inch clay lense, soft, saturated.			1,3,3,4	
40		2/2	SAT	SILTY SAND : Grayish orange pink, rounded, mica, saturated, 4 inch clay lense, soft, saturated.			4,5,3,4	
45		2/2	0	SILTY SAND : Grayish orange pink, rounded, well sorted, mica, damp.			5,8,8,9	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-29	
CLIENT: SOUTHNAVFACENGCOM				PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.			DATE STARTED: 05/19/93		COMPLTD: 05/19/93
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 62FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:			SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
4				SAND : Light brown, fine- to medium-grained, poorly sorted, gravel, old railroad bed.		SM		
5		1.5/2	420	SAND : Dark yellowish brown, fine-grained, well-rounded, well-sorted.		ML	11,10,13,20	
10		1.5/2	700	SAND : Olive gray, fine-grained, rounded, well-sorted, compact, unidentifiable odor, possibly aged petroleum.			6,20,35,37	
15			1100	CLAYEY SAND : Light brown, fine- to medium-grained, poorly sorted, wood fragments, possibly old railroad ties, damp.		SC	5,2,4,8	
20		2/2	1600	SANDY CLAY : Very pale orange, moderate red, inelastic, stiff, petroleum odor.		CL	4,7,13,15	
25		2/2	55	SAND : Very pale orange, moderate reddish brown, fine- to medium-grained, rounded, loose, dry.		SM	6,8,10,8	
30		1.7/2	0	SAND : Dusky red, very pale orange, very coarse with gravel 5mm fining downward to fine sand, rounded, well-sorted.		GM	4,4,8,8	
35		1.5/2	22	SAND : Very pale orange, fine- to coarse-grained, poorly-graded, some gravel, subangular, loose, dry.			13,10,8,10	
40		1.9/2	10	SAND : Very pale orange, medium- to coarse-grained, subrounded, loose, dry.		SP	19,8,8,9	
45		1.7/2	1	SILTY SAND : Very pale orange, very fine-grained, rounded, mica, damp.		ML	15,10,8,11	
50		1.7/2	14	SAND : Very pale orange, medium-grained, poorly-sorted, mica, loose.		SM	21,18,17,16	
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-29	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/19/93		COMPLTD: 05/19/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 62FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.9/2	4	SAND : Very pale orange, medium-grained, poorly-sorted, loose, mica.		SM	15,13,15,18	
60		1.7/2	4	SAND : Very pale orange, coarse-grained, angular, gravel.		SW	36,17,17,19	
65								
70								
75								
80								
85								
90								
95								
100								
105								
110								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-30	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/21/93		COMPLTD: 05/21/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
6				SAND : Dark yellowish brown, fine-grained, rounded, gravel.		ML		
5		1.6/2	600	SAND : Olive gray, fine-grained, rounded, petroleum odor.				12,10,10,13
10		1.6/2	1100	SAND : Olive gray, fine-grained, rounded, petroleum odor.				12,6,9,6
15		1.5/2	50	CLAYEY SAND : Olive gray, medium-grained, moist.		SC	8,5,5,5	
20		1/2	15	CLAYEY SAND : Very pale orange, fine-grained, hard.				5,4,16,16
25		1.5/2	70	SAND : Very pale orange, moderate red, fine- to very coarse-grained, gravel, angular, loose, dry.		GP	7,11,10,9	
30		2/2	0	CLAYEY SAND : Moderate red, fine- to medium-grained, subrounded, damp.			SC	6,7,7,8
35		2/2	0	SAND : Very pale orange, medium- to very coarse-grained, gravel, angular, damp.		GP	7,7,9,9	
40		2/2	0	SAND : medium-grained, subrounded, clayey lenses, moist.			SP	9,12,11,13
45		2/2	0	SILTY SAND : Moderate reddish brown, very fine-graded to coarse-grained with depth, moist.		GM	13,12,13,12	
50								
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TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-31	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/01/93		COMPLTD: 06/01/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				CLAYEY SAND : Moderate yellowish brown, fine- to medium-grained, damp.		SC		
5		1.9/2	30	SAND : Dark yellowish brown, fine-grained, well-rounded, mica, trace clay, moist.		ML	16,10,13,14	
10		1.9/2	6100	SAND : Dark yellowish brown, fine-grained, well-rounded, mica, trace clay, moist.			24,9,12,6	
15		1.9/2	3	CLAYEY SAND : Moderate reddish brown, medium-grained, damp.		SC	14,4,4,4	
20		1.5/2	0	SAND : Moderate reddish brown, medium-grained, rounded, some clay.			6,9,11,10	
25		1.4/2	2	SAND : Very pale orange, coarse-grained, angular, poorly-sorted, clay lenses, dry.		SW	3,7,6,11	
30		1.4/2	0	SAND : Moderate reddish brown, very pale orange, fine-grained, rounded, stratified with medium sand and clayey lenses, dry.		ML	10,9,11,11	
35		1.7/2	0	SAND : Very pale orange, medium-grained, subrounded, mica, dry.		SP	12,10,7,8	
40		1.6/2	0	SAND : (0 to 11 in.) Moderate reddish brown, medium-grained, subrounded, mica. (11 to 20 in.) CLAY : (11 to 20 in.) Bluish white, silty, very stiff, overlain by large gravel, dry.			10,11,9,17	
45		0.5/2	0	SAND : Very pale orange, medium- to coarse-grained, small gravel, loose, dry.			10,10,7,12	
50								
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-32	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/01/93		COMPLTD: 06/01/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: 168.00 FT.		MONITOR INST.: OVA		TOT DPTH: 72FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			0	CLAYEY SAND : Light brown, fine- to medium-grained, damp.		SC		
5		0.9/2	0	SAND : Moderate reddish brown, fine- to medium-grained, trace clay, damp.		SM	8,2,2,2	
10		2/2	8	SAND : Moderate reddish brown, fine- to medium-grained, trace clay, damp.			4,7,4,4	
15		1.9/2	200	CLAYEY SAND : Mottled, moderate red, very pale orange, dark yellowish orange, fine-grained, rounded, damp.		SC	4,6,9,11	
20		2/2	2000	SANDY CLAY : Hard, inelastic, strong petroleum odor, almost a sheen on the clay.		CL	5,7,10,14	
25		2/2	2000	SAND : Moderate orange pink, fine- to coarse-grained, well-graded, well-rounded, strong petroleum odor, dry.		GM	5,7,7,8	
30		2/2	2100	SAND : Moderate orange pink, fine- to coarse-grained, well-graded, well-rounded, strong petroleum odor, dry.			5,7,6,8	
35		1.6/2	2300	SAND : Very pale orange, fine- to medium-grained, rounded, mica, strong petroleum odor, dry.		SM	5,6,9,11	
40		1.6/2	2300	SAND : Very pale orange, Medium- to coarse-grained, angular, some gravel, loose, strong petroleum odor, dry.		ML	13,13,10,13	
45		2/2	50	SILTY SAND : Very light gray, very fine-grained, well-rounded, trace clay.			6,6,7,7	
50		1.6/2	90	SILTY SAND : Very light gray, very fine-grained, rounded.		SM	10,8,10,9	
55						SP		

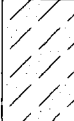
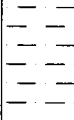







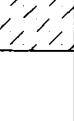
TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-32	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/01/93		COMPLTD: 06/01/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: 0	
TOC ELEV.: 168.00 FT.		MONITOR INST.: OVA		TOT DPTH: 72FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	




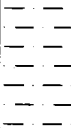
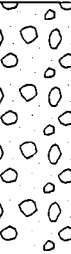



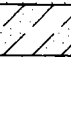

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS Continued from PAGE 1	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
		1.6/2	17	SAND : Very pale orange, medium- to very coarse-grained, some gravel, subangular, loose, dry.		SP	9,12,15,15	
60		1.5/2	70	SAND : Medium-grained, subangular, loose, mica, dry.			12,12,12,13	
65		1.6/2	0	SAND : Very pale orange, medium-grained, subrounded, loose, mica, dry.			9,16,15,19	
70		1.5/2	4	SAND : Very pale orange, moderate red, Medium-grading to coarse-grained, loose, dry.			20,15,19,20	
75								
80								
85								
90								
95								
100								
105								
110								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-33	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/02/93		COMPLTD: 06/02/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: 168.00 FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
4				SAND : Moderate brown, fine- to medium-grained, subrounded, compact, damp.		SM		
5		1/2	0	CLAYEY SAND : Moderate brown, fine-grained, rounded, mica, hard, damp.		SC	3,3,5,6	
10		1.6/2	40	CLAYEY SAND : Moderate brown, fine-grained, rounded, mica, damp.			5,6,6,5	
15		0.5/2	800	SAND : Dark yellowish orange, moderate, reddish brown, fine-grained, subrounded, trace clay, damp.		ML	5,12,16,14	
20		2/2	15	CLAYEY SAND : Pale reddish brown, grayish orange, medium-grained, subangular, some gravel, dry.		SC	5,9,13,14	
25		1.6/2	37	SAND : Moderate reddish brown, very pale orange, medium-grained with gravel grading to coarse-grained with gravel, subangular, dry.		SP	5,7,9,9	
30		1.6/2	0	SAND : Very pale orange, medium-grained, subrounded, mica, loose, dry.			5,7,9,9	
35		2/2	0	SAND : Very pale orange, medium-grained, subangular, loose, mica, dry.			6,7,9,12	
40		1.6/2	4	SAND : Very pale orange, medium-grained, subangular, loose, some rounded gravel, dry.			8,12,15,13	
45		1.6/2	4	SILTY SAND : Very pale orange, fine- to medium grained, subrounded, loose.		SM	7,12,14,15	
50								
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TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-34	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/02/93		COMPLTD: 06/02/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: 165.00 FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			0	SAND : Moderate brown, fine-grained, rounded, trace clay.		ML		
5		2/2	0	CLAYEY SAND : Moderate reddish brown, grayish orange, fine-grained, rounded, damp.		SC	9,4,9,5	
10		1.6/2	4	CLAYEY SAND : Moderate reddish brown, grayish orange, medium-grained, subrounded, compact, dry.			7,6,8,7	
15		1.6/2	0	SAND : Moderate orange pink, fine-grained, rounded, loose, damp.		ML	7,7,8,9	
20		1.6/2	2	SAND : Grayish orange, coarse- with gravel, subangular, graded, to medium-grained with gravel, subangular, loose, dry.		SP	8,8,9,10	
25		1.2/2	0	SAND : Very pale orange, fine- to medium-grained, well-graded, mica, dry.		SM	6,10,8,10	
30		1.5/2	1	SAND : Very pale orange, fine- to medium-grained, well-graded, some subrounded gravel, mica, loose, dry.			6,8,9,10	
35		2/2	2	SAND : Very pale orange, very fine- to medium-grained, rounded, mica, loose, dry.			10,13,8,8	
40		2/2	2	SAND : (0 to 20 in.) Silty sand, very pale orange, very fine-grained, well-rounded, well-sorted, damp. (20 to 22 in.) Clay, very pale orange, silty, soft, damp. (22 to 24 in.) Sand, grayish pink, medium-grained, well-rounded.			6,4,9,13	
45		2/2	0	SAND : Very pale orange, fine- to medium-grained, well-rounded, mica, slightly damp.			8,10,16,16	
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TITLE: NAS Whiting Field					LOG of WELL:		BORING NO. AST-SB-35		
CLIENT: SOUTHNAVFACENGCOM							PROJECT NO: 7518-30		
CONTRACTOR: Groundwater Protection Inc.					DATE STARTED: 06/02/93		COMPLTD: 06/02/93		
METHOD: 2.25" HSA			CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D		
TOC ELEV.: 168.00 FT.			MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.		
LOGGED BY: N. Pagano			WELL DEVELOPMENT DATE:				SITE: 2894		
DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	SAND : Moderate reddish brown, fine-grained, rounded, damp.		ML		
5			1/2	0	CLAYEY SAND : Moderate reddish brown, fine-grained, rounded, damp.		SC	2,1,1,2	
10			2/2	0	CLAYEY SAND : Dark yellowish brown, fine-grained, rounded, moist.			5,5,1,2	
15			1.6/2	0	CLAYEY SAND : Moderate reddish brown, fine-grained, ronded, mica, moist.			3,2,4,4	
20			1.6/2	1	SAND : (0 to 6 in.) Clay, sandy, very pale orange, hard, inelastic, dry. (6 to 20 in.) Sand, moderate reddish brown, very coarse-grained, angular, gravel, trace clay, dry.		GP	10,16,15,15	
25			2/2	1	SAND : Moderate reddish brown, very coarse-grained, gravel, angular, loose, dry.			9,9,12,13	
30			2/2	1	SAND : Very pale orange, moderate reddish brown, fine- to medium-grained, well-graded, rounded, loose, dry.		SM	6,10,12,11	
35			1.6/2	1	SAND : Moderate reddish brown, light brown, medium-grained, well-sorted, subangular, loose, slightly damp.		SP	7,9,12,11	
40			1.5/2	0	SAND : Moderate reddish brown, very pale orange, medium- to coarse-grained, angular, gravel, clayey lenses, loose, dry.			10,13,21,17	
45			1.9/2	0	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, trace silt and clay.		ML	8,10,9,10	
50									
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PAGE 1 of ASTSR35

ABB ENVIRONMENTAL SERVICES INC

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-36	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/02/93		COMPLTD: 06/02/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 52FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate brown, fine-grained, rounded, trace clay.		ML		
5		2/2	0	SAND : Light brown, fine-grained, well-rounded, well-sorted, damp.			5,5,4,4	
10		2/2	0	CLAYEY SAND : Moderate reddish brown, dark yellowish orange, fine-grained, rounded, dry.		SC	10,12,13,9	
15		2/2	0	CLAYEY SAND : Moderate reddish brown, fine-grained, rounded, compact, damp.			4,5,4,10	
20		2/2	2100	SILTY CLAY : Moderate red, very pale orange, stiff, inelastic, dry.		CL	4,4,6,8	
25		2/2	35	CLAYEY SAND : Moderate red, very fine-grained, silt, soft, moist.		SC	3,3,3,7	
30		2/2	3	SAND : Moderate red, very fine-grained, sand and clay, moist.			4,4,5,5	
35		2/2	SAT	SAND : Moderate red, very fine-grained, sand and clay, moist.			1,3,3,5	
40		2/2	SAT	SAND : Moderate red, very pale orange, layers of sand, fine-grained, clay, sand, very coarse-grained, with gravel, saturated.		ML	3,5,9,10	
45		2/2	0	SAND : Very pale orange, very fine-grained, rounded, mica, damp.			8,12,10,10	
50		1.9/2	0	SAND : Very pale orange, very fine-grained, rounded, mica, damp.			13,20,21,28	
55								

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-37
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/02/93		COMPLTD: 06/03/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D	
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 57FT.	DPTH TO ∇ FT.	
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5					SAND : Fine-grained, rounded, hard, very dry.		ML		
10			1.6/2	0	CLAYEY SAND : Moderate reddish brown, fine- to medium-grained, rounded, damp.		SC	10,11,15,14	
15			1.5/2	1500	CLAYEY SAND : (0 to 10 in.) Very pale orange, fine-grained, compact, rounded. (10 to 18 in.) Moderate reddish brown, medium-grained, rounded, loose, saturated, strong petroleum odor.			4,5,12,7	
20			1.6/2	1500	CLAY : Dusky red, very pale orange, with sand, medium- to coarse-grained, stiff, inelastic.		CL	5,5,9,8	
25			1.9/2	1700	CLAYEY SAND : Very light gray, moderate orange pink, very fine-grained, well-rounded, trace silt, soft, damp, strong petroleum odor.		SC	2,1,1,1	
30			2/2	1600	SAND : Grayish orange yellow, moderate red, very fine-grained, rounded, clay lenses, soft.		ML	4,5,4,6	
35			2/2	SAT	SAND : Grayish orange yellow, moderate red, very fine-grained, rounded, clay lenses, soft, saturated.		ML	1,1,2,4	
40			2/2	60	SAND : Very pale orange, medium-grained, rounded, well-sorted, mica.		SP	4,10,12,13	
45			2/2	16	SAND : Very pale orange, medium-grained, rounded, well-sorted, mica.			7,10,13,13	
50			2/2	2	SAND : Very light gray, very fine-grained, with fines, compact, well-rounded, damp.		ML	7,8,9,11	
55			2/2	5	SAND : Very pale orange, coarse-grained, angular, gravel.		SP	9,12,19,18	

TITLE: NAS Whiting Field			LOG of WELL:		BORING NO. AST-SB-38	
CLIENT: SOUTHNAVFACENGCOM					PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.			DATE STARTED: 06/03/93		COMPLTD: 06/03/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 52FT.		DPTH TO ∇ FT.
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:			SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Light brown, fine-grained, rounded, compact, dry.		ML		
5		1.5/2	600	SAND : Dark yellowish brown, fine-grained, rounded, mica, damp.		ML	3,4,12,12	
10		2/2	1300	SAND : Moderate reddish brown, medium-grained, rounded, some clay, mica, damp.		SP	6,5,10,14	
15		2/2	110	CLAYEY SAND : Moderate reddish brown, fine-grained, rounded, mica, damp.		SC	6,5,6,7	
20		1/2	15	SILTY CLAY : Very pale orange, grayish orange, stiff, inelastic.		CL	2,3,6,8	
25		2/2	SAT	SAND : Very pale orange, very fine-grained, with fines, damp.		ML	1,2,2,1	
30		2/2	SAT	SILTY CLAY : Very pale orange, dusky red, soft, saturated.		SC	1,2,1,4	
35		2/2	SAT	SAND : Very pale orange, medium-grained, rounded, well-sorted, mica, saturated.		SP	2,5,3,6	
40		1.6/2	27	SAND : Very pale orange, medium-grained, rounded, poorly-sorted, mica, moist.		SM	6,8,10,14	
45		2/2	1	SAND : Light gray, very fine-grained, with silt, compact, rounded.		SM	5,7,6,7	
50		1.6/2	4	SAND : Very pale orange, fine-grained, subrounded, mica.		ML	8,8,9,9	
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-39	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/03/93		COMPLTD: 06/04/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 87FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Light brown, very fine-grained, dry.		ML		
5		1.6/2	600	CLAYEY SAND : Medium-grained.		SC	1,2,2,1	
10		2/2	20	CLAYEY SAND : Light brown, fine-grained, rounded, damp.			3,4,2,4	
15		2/2	210	CLAYEY SAND : Moderate reddish brown, very pale orange, medium-grained, rounded, mica, damp, petroleum odor.			3,4,6,6	
20		2/2	2	CLAY : Grayish red, verystiff, inelastid, some silt and fines, dry.		CL	4,8,11,14	
25		1.6/2	2100	CLAYEY SAND : Moderate reddish brown, fine-grained, rounded.		SC	4,7,7,3	
30		2/2	1600	SAND : Very pale orange, moderate reddish brown, medium-grained, angular, with gravel, loose, dry.		SP	6,7,11,8	
35		2/2	500	SAND : Very pale orange, Moderate reddish brown, medium-grained, angular, with gravel, loose, dry.			5,3,11,10	
40		2/2	2000	SAND : Very pale orange, coarse-grained, angular, mica, loose, dry, petroleum odor.			6,11,10,10	
45		2/2	2100	SILTY SAND : Very pale orange, very fine-grained, well-rounded, well-sorted, compact, mica, petroleum odor.		ML	7,7,7,7	
50		2/2	SAT	SAND : Very pale orange, very fine-grained, silty, saturated.			1,1,3,7	
55						SP		

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-39	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/03/93		COMPLTD: 06/04/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 87FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		2/2	700	SAND : Very pale orange, coarse-grained, angular, loose, angular gravel, petroleum odor.		SP	9,11,13,15	
60		2/2	80	SAND : Very pale orange, coarse-grained, angular, loose, "sugar sand".			6,11,12,11	
65		1.6/2	38	SAND : Very pale orange, medium-grained, angular, loose, trace gravel, subangular.			11,16,15,15	
70		1.6/2	24	SAND : Moderate orange pink, medium-grained, subrounded, dry.			10,16,23,28	
75		2/2	100	SAND : Pale yellowish orange, medium-grained, angular, dry.			17,30,50,R	
80		1.5/2	9	SAND : Very pale orange, fine- to medium-grained, angular, loose, dry.		SM	10,21,28,25	
85		1.6/2	SAT	SAND : Dark yellowish orange, coarse-grained, gravel, angular, saturated.		SP	9,14,21,40	
90								
95								
100								
105								
110								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-40	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/03/93		COMPLTD: 06/03/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				1 SAND : Light brown, medium-grained, subrounded, hard.		SP		
5		1.5/2	0	CLAYEY SAND : Moderate reddish brown, fine-grained, rounded, damp.		SC	8,4,7,5	
10		1.5/2	1	SAND : Grayish brown, fine- to medium-grained, rounded, loose, dry.		SM	10,12,9,6	
15		1.5/2	1	SAND : Moderate reddish brown, medium-grained, subrounded, trace clay.		SP	8,5,3,4	
20		1.6/2	0	CLAYEY SAND : Moderate reddish brown, medium-grained, subrounded.		SC	5,5,9,11	
25		1.5/2	0	SAND : Moderate reddish orange, medium-grained, subangular, with gravel, loose, dry.			6,8,9,7	
30		1.4/2	1	SAND : Moderate reddish orange, fine- to coarse-grained, well-graded, subrounded, loose, dry.		GM	9,7,9,9	
35		1.5/2	0	SAND : Moderate reddish orange, fine- to medium-grained, subrounded, some gravel, loose, dry.		SM	4,7,10,12	
40		1.6/2	0	SAND : Moderate reddish orange, fine-grained, well-rounded, well-sorted, dry.			12,8,9,15	
45		1.6/2	0	SAND : Very pale orange, fine- to medium-grained, subrounded, loose, dry.			19,17,12,11	
50								
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-41	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/04/93		COMPLTD: 06/04/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.6/2	0	SAND : Moderate brown, fine- to medium-grained, subrounded, damp.		SM		
10		2/2	0	SAND : Moderate brown, fine- to medium-grained, with clay, subrounded, moist.			9,7,6,7	
15		1.9/2	0	CLAYEY SAND : Moderate reddish brown, fine-grained, subangular, damp.		SC		
20		2/2	0	CLAYEY SAND : Light brown, fine-grained, rounded, damp.			12,10,12,13	
25		2/2	0	SILTY CLAY : Very pale orange, moderate reddish brown, trace fine sand, very stiff, inelastic.				
30		2/2	0	SAND : Moderate red, moderate reddish brown, very fine- to fine-grained, some silt and clay lenses, damp.		ML	4,5,9,6	
35		1.9/2	0	SAND : Very pale orange, very fine-grained, well-rounded, well-graded, trace silt, mica.				
40		1.9/2	0	SAND : Very pale orange, very fine-grained, well-rounded, well-graded, trace silt, mica, damp.			7,6,8,7	
45		1.6/2	0	SILTY SAND : Very pale orange, very fine-grained, well-rounded, trace clay, mica, damp.				
50			0	SAND : Very pale orange, very fine-grained, well-rounded, well-graded, trace silt, mica, damp.			8,10,10,10	
55			0	SILTY SAND : Very pale orange, very fine-grained, well-rounded, well-sorted, mica.			7,7,12,7	
			0				9,10,12,11	

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-42	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/04/93		COMPLTD: 06/04/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 52FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			0	SAND : Moderate brown, fine- to medium-grained, subrounded, damp.		SM		
5		1.6/2		CLAYEY SAND : Moderate brown, medium-grained, rounded, mica, damp.		SC	7,6,5,10	
10		2/2	0	CLAYEY SAND : Moderate reddish brown, fine- to medium-grained, subrounded, compact, dry.			8,8,11,10	
15		1.9/2	1000	SILTY CLAY : Dusky red, very pale orange, fine- to medium-grained, some sand and gravel, unidentified inclusions, crystalline, hard.		CL	4,5,8,10	
20		2/2	1600	SILTY CLAY : Moderate pink, very fine-grained, sand, soft, moist.			2,3,3,2	
25		2/2	20	SAND : Very pale orange, moderate orange pink, very fine-grained, well-sorted, well-rounded, mica, trace clay.		ML	5,4,4,5	
30		1.5/2	4	SAND : Very pale orange, moderate orange pink, very fine-grained, well-sorted, well-rounded, mica, trace clay.			5,4,6,7	
35		2/2	SAT	SAND : Moderate orange pink, very fine- to fine-grained, silty, some clay, saturated.			1,1,3,4	
40		1.6/2	10	SAND : Very pale orange, medium-grained, subrounded, mica, loose.		SP	6,12,15,14	
45		1.5/2	0	SAND : Very pale orange, medium-grained, subrounded, mica, loose.			7,12,14,16	
50		1.6/2	2	SAND : Very pale orange, medium-grained, subangular, loose, mica, dry.			7,14,14,15	
55								

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-43	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/04/93		COMPLTD: 06/04/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	SAND : Moderate brown, medium-grained, subrounded, hard.		SP		
5			1.6/2	0	SAND : Moderate reddish brown, very pale orange, dark yellowish orange, medium-grained, subrounded, with clay.			5,12,14,12	
10			1.6/2	0	CLAYEY SAND : Very pale orange, pale yellowish orange, very fine-grained, rounded, silty.		SC	3,6,10,4	
15			2/2	0	SILTY CLAY : Very pale orange, moderate red, some sand, medium-grained, inelastic.		CL	4,6,9,11	
20			1.6/2	0	SILTY CLAY : Moderate orange pink, soft, inelastic, moist.			3,4,5,6	
25			1.9/2	0	SAND : Moderate red, very fine-grained, well-rounded, well-sorted, mica.		ML	6,6,4,8	
30			1.6/2	0	SAND : Pale red, very fine-grained, with silt, clay lenses, moist.			3,2,6,6	
35			1.6/2	0	SILTY SAND : Pinkish gray, very fine-grained, rounded, well-sorted, mica.			4,8,8,7	
40			1.5/2	0	SAND : Very pale orange, fine-grained, subrounded, some silt, mica, damp.			4,7,8,9	
45			2/2	0	SAND : Very pale orange, fine-grained, subrounded, some silt, mica, damp.			14,8,10,15	
50									
55									

TITLE: NAS Whiting Field				LOG of WELL:		BORING NO. AST-SB-44	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 06/04/93		COMPLTD: 06/04/93	
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:		PROTECTION LEVEL: D	
TOC ELEV.: FT.		MONITOR INST.: OVA		TOT DPTH: 47FT.		DPTH TO ∇ FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			0	SAND : Light brown, fine-grained, rounded, compact, dry.		ML		
5		1/2	0	CLAYEY SAND : Grayish orange, medium-grained, subrounded, damp.		SC	4,4,6,12	
10		1.5/2	1	SAND : Moderate reddish brown, coarse- to very coarse-grained, some clay and gravel, angular, poorly-sorted.		GP	12,10,13,11	
15		1.6/2	0	SAND : Moderate reddish brown, medium-grained, subangular, gravel, subangular, loose, dry.		SP	5,8,7,8	
20		1.9/2	1	SAND : Very pale orange, fine-grained, subrounded, loose, mica, dry.		ML	6,6,8,7	
25		1.5/2	1	SAND : Very pale orange, medium-grained, subangular, some gravel, loose, dry.		SP	7,10,12,13	
30		1.9/2	0	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, mica, dry.		ML	6,6,8,8	
35		1.6/2	0	SAND : Very pale orange, coarse-grained, angular with subangular gravel, loose, dry.		GP	11,9,12,12	
40		1.5/2	1	SAND : Very pale orange, Coarse-grained, subangular, loose, dry.			12,16,15,15	
45		1.6/2	0	SAND : Very pale orange, medium-grained, angular, well-sorted, loose, dry.		SP	12,9,15,14	
50								
55								

TITLE: NAS Whiting Field				LOG of WELL: WHF-2894-1		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 4/08/92		COMPLTD: 4/08/92	
METHOD: 6.25" HSA		CASE SIZE: 4 inch		SCREEN INT.: 80'-90'		PROTECTION LEVEL: D	
TOC ELEV.: 167 FT.		MONITOR INST.: OVA		TOT DPTH: 96FT.		DPTH TO ∇ 85 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	SAND: Olive gray to gray, fine- to medium-grained, trace clay.		SM	POSTHOLE	
10		2.0/2	0.0	CLAYEY SAND: Reddish brown to grayish orange to pinkish gray. fine- to medium-grained.		SC		
15		1.0/2	0.0	CLAYEY SAND: Grayish orange to brown to Pinkish gray, fine- to medium-grained.				
20		1.2/2	0.0	SAND: Light red to white to pale yellowish brown, fine- to medium-grained.		SM		
25		2.0/2	0.0	SAND: White to light red to dark yellowish orange to pinkish gray, fine- to medium-grained.				
30		1.7/2	0.0	SAND: Pale yellowish brown to pinkish gray to white, fine- to medium-grained.				
35		1.3/2	0.0	SAND: Pinkish gray to white, fine- to medium-grained, trace silt.				
40		1.5/2	0.0	SAND: Pinkish gray to grayish orange to gray, fine- to medium-grained, trace clay.				
45		1.5/2	0.0	SAND: Pinkish gray to grayish orange to gray, fine- to medium-grained.				
50		1.5/2	0.0					
55								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-1	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-40
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/08/92	COMPLTD: 4/08/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 80'-90'	PROTECTION LEVEL: D
TOC ELEV.: 167 FT.	MONITOR INST.: OVA	TOT DPTH: 96FT.	DPTH TO ∇ 85 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
		1.7/2	0.0		SAND: Pinkish gray to grayish orange to gray, fine- to medium-grained.		SM		
60		1.6/2	0.0		SAND: White to grayish orange, fine- to medium-grained, some gravels.				
65		1.5/2	0.0						
70		1.5/2	0.0		SAND: White, fine- to medium-grained.				
75		1.8/2	0.0		SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, trace clay.		GM		
80		1.1/2	1.0		SAND: Moderate pink to pale yellowish brown to white, fine-grained.		ML		
85		1.1/2	N.M.		SAND: Moderate red to pale yellowish brown to pinkish gray to grayish orange, fine- to coarse-grained, wet.		GM		
90		2.0/2	0.0		SANDY CLAY: Pinkish gray to light brown to pale yellowish brown, fine- to medium-grained, moderate clay.		CL		
95		2.0/2	0.0		CLAY: Light red to pale yellowish brown to brown to white, fine- to medium-grained, stiff.		CH		
100									
105									
110									

TITLE: NAS Whiting Field				LOG of WELL: WHF-2894-2		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 04/09/92		COMPLTD: 04/09/92	
METHOD: 6.25" HSA		CASE SIZE: 4 INCH		SCREEN INT.: 70'-85'		PROTECTION LEVEL: D	
TOC ELEV.: 159 FT.		MONITOR INST.: OVA		TOT DPTH: 86FT.		DPTH TO ∇ 81 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
						CL		
							POSTHOLE	
5		2/2	0.0	SANDY CLAY : Brown, saturated.			2,2,2,6	
10		2/2	1.0	CLAYEY SAND : Mottled, red, grayish orange, dark yellowish orange, fine-grained.		SC	6,9,9,9	
15		2/2	1.0	SAND : Gray, Fine-grained, well-sorted, trace clay. SAND : red, medium-grained, well-sorted.		ML	6,9,9,10	
20		2/2	2.0	SAND : Red and grayish orange stripped, medium- to coarse-grained, gravelly.		SW	6,7,7,8	
25		2/2	2.0	SAND : White, medium-grained, well-graded.			6,6,7,8	
30		2/2	2.0	SAND : Very pale orange with red, fine- to medium-grained.		SM	8,15,21,22	
35		2/2	2.0	SAND : Grayish orange and red, medium- to coarse-grained, last 4 inches are gray silt with clay.		SP	11,11,9,10	
40		2/2	1.0	SANDY SILTY CLAY : Moderate pink, gravel < 5 mm., sand, medium-grained.		GM	0,0,7,14	
45		2/2	1.0	SAND : White, fine- to medium-grained, some gravel.			10,12,14,14	
50		2/2	0.0	SAND : White, fine- to medium-grained.		SM	14,19,25,23	
55						GM		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-2	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 04/09/92	COMPLTD: 04/09/92
METHOD: 6.25" HSA	CASE SIZE: 4 INCH	SCREEN INT.: 70'-85'	PROTECTION LEVEL: D
TOC ELEV.: 159 FT.	MONITOR INST.: OVA	TOT DPTH: 86FT.	DPTH TO ∇ 81 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
			2/2	1.0	SAND: White, fine- to coarse-grained, poorly-graded.		GM	18,20,23,23	
60			1.5/2	0.0	SAND : Red, dark yellowish orange, very pale orange, stripped, medium- to very coarse-grained, clayey lenses.		SP	0,0,12,12	
65			1.6/2	0.0	SAND : Dark yellowish orange, very fine-grained, well-sorted, damp.		ML	10,12,12,12	
70			1.5/2	0.0	SAND : Very pale orange, dark yellowish orange, medium- to coarse-grained, damp.		SP	22,22,24,29	
75			1.2/2	0.0	SAND : Dark yellowish orange, grayish orange, fine- to coarse-grained, wet.		GM	26,33,33,35	
80			1.2/2	1.0	SAND : dark yslowish orange, grayish orange, medium- to very coarse-grained, saturated.		SP	10,12,14,14	
85			1.5/2	0.0	SAND : Brown, medium- to very coarse-grained, gravelly, saturated.			Wt. of Rod	
90									
95									
100									
105									
110									

TITLE: NAS Whiting Field				LOG of WELL: WHF-2894-3		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 4/09/92		COMPLTD: 4/09/92	
METHOD: 6.25" HSA		CASE SIZE: 4 inch		SCREEN INT.: 70'-80'		PROTECTION LEVEL: D	
TOC ELEV.: 154.17' FT.		MONITOR INST.: OVA		TOT DPTH: 86FT.		DPTH TO ∇ 73 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.7/2	0.0	CLAY: Brown to pinkish gray to white, fine- to medium-grained, stiff.		CL	POSTHOLE	
10		1.9/2	0.0	SANDY CLAY: Reddish brown to pinkish gray, fine- to medium-grained.				
15		1.8/2	0.0	SAND: Grayish orange to brown to pinkish gray, fine- to medium-grained, few gravels.		SM		
20		2.0/2	0.0	SAND: Very pale orange, white, fine- to medium-grained.				
25		N.R.	N.M.	NO RECOVERY				
30		1.9/2	N.M.	SAND: Very pale orange, white, grayish orange, fine- to medium-grained.				
35		1.1/2	0.0	SAND: Pinkish gray to white, fine- to medium-grained.				
40		1.1/2	1.0	SAND: Pinkish gray to white, fine- to medium-grained.				
45		1.5/2	0.0	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, few gravel.		GM		
50		1.6/2	3.0			SM		
55								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-3	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-40
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/09/92	COMPLTD: 4/09/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 70'-80'	PROTECTION LEVEL: D
TOC ELEV.: 154.17' FT.	MONITOR INST.: OVA	TOT DPTH: 86FT.	DPTH TO ∇ 73 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
		1.7/2	0.0		SAND: White, pale yellowish orange, fine-grained, moist.		SM		
60		1.3/2	0.0		SAND: Brown, pale yellowish orange, fine- to coarse-grained.				
65		1.5/2	0.0						
70		1.3/2	3.0		SAND: White, brown, fine- to medium-grained.				
75		1.9/2	N.M.		SAND: Pinkish gray to orange, fine- to coarse-grained.		GM		
80		2.0/2	0.0		CLAY: Red, gray, very pale orange, fine-grained, stiff.		CL		
85		2.0/2	N.M.		CLAY: Very pale orange, gray, grayish orange, white, fine- to medium-grained, stiff.				
90									
95									
100									
105									
110									

TITLE: NAS Whiting Field				LOG of WELL: WHF-2894-4		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 4/11/92		COMPLTD: 4/11/92	
METHOD: 6.25" HSA		CASE SIZE: 4 inch		SCREEN INT.: 75'-90'		PROTECTION LEVEL: D	
TOC ELEV.: 164.86' FT.		MONITOR INST.: OVA		TOT DPTH: 91FT.		DPTH TO ∇ 83 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	CLAYEY SAND: Reddish brown to brown to pinkish gray, fine- to medium-grained.		SC	POSTHOLE	
10		1.0/2	0.0					
15		0.8/2	0.0	CLAYEY SAND: Reddish brown to brown to pinkish gray, fine- to medium-grained.				
20		1.3/2	0.0	SANDY CLAY: Light red to white to pale yellowish brown, fine- to medium-grained, very stiff.				
25		1.6/2	0.0					
30		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.		SM		
35		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.				
40		2.0/2	0.0	SAND: Grayish orange, pinkish gray, white, fine- to coarse-grained, trace clay, few gravel.		GM		
45		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.		SM		
50		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.				
55						GM		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-4		BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/11/92		COMPLTD: 4/11/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 75'-90'	PROTECTION LEVEL: D	
TOC ELEV.: 164.86' FT.	MONITOR INST.: OVA	TOT DPTH: 91FT.	DPTH TO ∇ 83 FT.	
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
		1.2/2	0.0		SAND: Light red to reddish brown to grayish orange, fine- to coarse-grained, little gravel.		GM		
60		1.0/2	0.0						
65		1.0/2	0.0		SAND: Light red to grayish orange, fine- to coarse-grained, little gravel.				
70		1.0/2	0.0		SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained with moderate gravels.				
75		1.3/2	0.0		SAND: Light red to reddish brown to pinkish gray, fine- to coarse-grained with some gravels.				
80		1.7/2	0.0		SAND: Light red to reddish brown, fine- to coarse-grained, with moderate gravel, moist throughout.				
85		1.8/2	0.0						
90		2.0/2	0.0		SAND: Light red to reddish brown, fine- to coarse-grained, with moderate gravel, saturated.				
95									
100									
105									
110									

TITLE: NAS Whiting Field				LOG of WELL: WHF-2894-5		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 4/12/92		COMPLTD: 4/12/92	
METHOD: 6.25" HSA		CASE SIZE: 4 inch		SCREEN INT.: 77'-87'		PROTECTION LEVEL: D	
TOC ELEV.: 167.52 FT.		MONITOR INST.: OVA		TOT DPTH: 96FT.		DPTH TO ∇ 81 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
							SC		
								POSTHOLE	
5			1.3/2	0.0	CLAYEY SAND: Reddish brown to moderate pink to white, fine- to medium-grained.				
10			1.7/2	100.0	SAND: Olive gray to dark yellowish orange, fine- to medium-grained, trace clay.		SM		
15			1.5/2	350.0	SAND: Brown to red to dark yellowish orange, fine- to medium-grained, trace clay.				
20			2.0/2	500.0	CLAY: Light red to white to brown to purple, stiff, slight odor detected.		CH		
25			2.0/2	2000	SAND: Light red to white to brown, fine- to medium-grained, trace clay, slight odor detected.		SM		
30			2.0/2	2000	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, slight odor detected.		GM		
35			2.0/2	2000	SAND: Pinkish gray to white, fine- to medium-grained, slight odor detected.		SM		
40			2.0/2	2000					
45			2.0/2	60.0	SAND: White to pinkish gray to grayish orange, fine-grained, some silt, odor detected.		ML		
50			2.0/2	200.0	SANDY CLAY: Pinkish gray to grayish orange, to gray, fine-grained, slight odor detected.		SC		
55							GM		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-5	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/12/92	COMPLTD: 4/12/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 77'-87'	PROTECTION LEVEL: D
TOC ELEV.: 167.52 FT.	MONITOR INST.: OVA	TOT DPTH: 96FT.	DPTH TO ∇ 81 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1							
		1.3/2 80.0	SAND: White to pinkish gray to grayish orange, fine- to coarse-grained with some gravel.		GM		
60		1.3/2 20.0					
65		1.1/2 14.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained, few gravel.		SM		
70		1.1/2 15.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.				
75		1.1/2 6.0	SAND: Brown to pinkish gray to white, fine- to medium-grained.				
80		1.0/2 0.0	SAND: Pale yellowish brown to pinkish gray to white, fine- to medium-grained.				
85		1.5/2 N.M.	SAND: Purple to brown to dark yellowish orange, fine- to coarse-grained.		GM		
90		1.8/2 5.0	CLAY: Gray to brown to pinkish gray, fine- to medium-grained, stiff.		CH		
95		2.0/2 0.0					
100							
105							
110							

TITLE: NAS Whiting Field				LOG of WELL: WHF-2894-6		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 4/13/92		COMPLTD: 4/13/92	
METHOD: 6.25" HSA		CASE SIZE: 4 inch		SCREEN INT.: 80'-90'		PROTECTION LEVEL: D	
TOC ELEV.: 166.86' FT.		MONITOR INST.: OVA		TOT DPTH: 96FT.		DPTH TO ∇ 82 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5						SM		
							POSTHOLE	
		1.8/2	200.0	SAND: Brown, fine-grained, hard, odor.			6,8,9,8	
10		1.8/2	150.0				3,12,15,14	
15		1.8/2	1000	CLAYEY SAND: Red, dark yellowish orange, grayish orange, very fine-grained, mottled, strong odor.		SC	7,9,13,16	
20		1.8/2	280.0	CLAY: Red, dark yellowish orange, very pale orange, mottled, some fine-grained, strong odor.		CL	5,6,11,13	
25		1.8/2	1000	SANDY CLAY: Brown, red, stiff, clay lenses, strong odor.		SC	6,9,6,8	
30		2.0/2	450.0	SAND: Red, brown, fine- to medium-grained, odor.		SM	11,9,9,9	
35		1.5/2	32.0	SAND: White, fine- to medium-grained, odor.			6,6,7,7	
40		1.5/2	30.0	SAND: White, fine- to medium-grained, odor.			6,7,7,9	
45		0.8/2	10.0	SAND: White, very fine-grained, silt, clay, less odor, damp.			5,6,8,8	
50		1.0/2	1.0	SAND: White, fine- to medium-grained.			-,-,8,10	
55						SW		

TITLE: NAS Whiting Field				LOG of WELL: WHF-2894-6		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 4/13/92		COMPLTD: 4/13/92	
METHOD: 6.25" HSA		CASE SIZE: 4 inch		SCREEN INT.: 80'-90'		PROTECTION LEVEL: D	
TOC ELEV.: 166.86' FT.		MONITOR INST.: OVA		TOT DPTH: 96FT.		DPTH TO ∇ 82 FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60 65 70 75 80 85 90 95 100 105 110		1.5/2	8.0	SAND: White, medium- to coarse-grained, quartz cobbles.	•••••	SW	-,-,12,16	
		1.0/2	14.0	SAND: White, medium-grained:	•••••	SP	10,12,15,16	
		1.2/2	6.0	SAND: Coarse- to very coarse-grained, quartz cobbles.	•••••	SW	12,16,18,18	
		1.5/2	2.0	SAND: Light grayish orange, fine- to medium-grained.	•••••	SM	-,-,22,30	
		1.6/2	2.0	SAND: Grayish orange, moderate pink, fine- to medium-grained, clayey sand lenses.	•••••	ML	-,12,13,22	
		1.0/2	7.0	SAND: Grayish orange with dark yellowish orange stripes, fine-grained, well-sorted.	•••••	ML	50,R	
		1.8/2	0.0	SAND: Brown, very dark red, grayish orange, very fine- to medium-grained, saturated.	•••••	ML	Wt. of Rod	
		2.0/2	0.0	SAND: Fine-grained (.5'), wet, stiff clay in remainder of spoon.	•••••	CL	5,6,8,7	
	2.0/2	0.0	CLAY: Purple, stiff.	•••••	CL	-,10,12,12		

TITLE: NAS Whiting Field				LOG of WELL: WHF 2894-7		BORING NO.		
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30		
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/17/93		COMPLTD: 05/20/93		
METHOD: 6.25 in. HSA		CASE SIZE: 4 inch		SCREEN INT.: 69-84 ft		PROTECTION LEVEL: D		
TOC ELEV.: 158.80 FT.		MONITOR INST.: OVA		TOT DPTH: 85FT.		DPTH TO ∇ 77.93 ft FT.		
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE: 7/13/93				SITE: 2894		
DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			3	CLAYEY SAND : Moderate reddish brown, fine- to medium-grained, moist.		SC		
5		1.5/2	0	SANDY CLAY : Very pale orange, dark yellowish brown, mottled, moderate reddish brown, fine-grained, hard, dry.		CL	4,8,12,17	
10		1.4/2	2	CLAYEY SAND : Moderate to reddish brown, medium- to very coarse-grained, gravel, angular, loose.		SC	10,9,15,11	
15		1.9/2	0	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist.		CL	10,7,7,6	
20		1.6/2	21	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist.			1,1,2,1	
25		2/2	15	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist, petroleum odor.			5,9,8,7	
30		2/2	4	SAND : Pale yellowish orange, fine-grained, poorly-sorted, rounded.		ML	4,8,10,12	
35		0.7/2	4	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, dry.			7,8,9,9	
40		1.6/2	2	SAND : Very pale orange, very fine-grained, well-sorted, well-rounded, dry.			7,8,11,9	
45		1.4/2	2	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, dry.			13,16,17,16	
50		1.5/2	8	SAND : Very pale orange, medium- to coarse-grained, poorly-graded, gravel, mica.		SP	9,12,16,16	
55						ML		

PAGE 1 of 2894-7

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS Whiting Field				LOG of WELL: WHF 2894-7		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 05/17/93		COMPLTD: 05/20/93	
METHOD: 6.25 in. HSA		CASE SIZE: 4 inch		SCREEN INT.: 69-84 ft		PROTECTION LEVEL: D	
TOC ELEV.: 158.80 FT.		MONITOR INST.: OVA		TOT DPTH: 85FT.		DPTH TO ∇ 77.93 ft FT.	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE: 7/13/93				SITE: 2894	

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60		1.7/2	1	SAND : Very pale orange, fine-grained, well-rounded, loose, mica, dry.		ML	11,15,18,15	
65		1.8/2	1	SAND : Very pale orange, fine- to medium-grained, well-graded, subrounded, damp.		SM	10,14,25,29	
70		1.7/2	4	SAND : Very pale orange, fine- to medium-grained, subrounded, well-graded, mica, damp.			14,34,29,32	
75		1.6/2	0	SAND : Very pale orange, pale yellowish orange, medium-grained, subrounded, well-sorted, mica, damp.			6,11,29,40	
80		1.5/2	1	SAND : Grayish orange, medium-grained, some fines, subrounded.		SP	11,23,32,35	
		1.6/2	SAT	SAND : Dark yellowish orange, medium-grained, subrounded, moist.		SM	19,24,35,40	
		2/2	SAT	SAND : Medium-grained graded to very coarse-grained, angular, saturated.		GP	22,23,24,29	
		2/2	SAT	SAND : Dusky red, coarse- to very coarse-grained, angular, saturated.			14,20,18,9	

TITLE: NAS Whiting Field				LOG of WELL: WHF-2894-ID		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 3/30/92		COMPLTD: 3/30/92	
METHOD: Mud Rotary		CASE SIZE: 4&8 inches		SCREEN INT.: 100'-114'		PROTECTION LEVEL: D	
TOC ELEV.: 164.91 FT.		MONITOR INST.: OVA		TOT DPTH: 114 FT.		DPTH TO ∇ 97 FT.	
LOGGED BY: J. Koch		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	CLAYEY SAND: Reddish brown to brown to Pinkish gray, fine- to medium-grained.		SC	POSTHOLE	
10		1.0/2	0.0					
15		0.8/2	0.0	CLAYEY SAND: Reddish brown to brown to pinkish gray, fine- to medium-grained.				
20		1.3/2	0.0	SANDY CLAY: Light red to white to pale yellowish brown, fine- to medium-grained, very stiff.		CL		
25		1.6/2	0.0					
30		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.		SM		
35		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained.				
40		2.0/2	0.0	SAND: Grayish orange, to pinkish gray to white, fine- to coarse-grained, trace clay, few gravel.		GM		
45		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.		SM		
50		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.				
55						GM		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-1D	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/30/92	COMPLTD: 3/30/92
METHOD: Mud Rotary	CASE SIZE: 4&8 inches	SCREEN INT.: 100'-114'	PROTECTION LEVEL: D
TOC ELEV.: 164.91 FT.	MONITOR INST.: OVA	TOT DPTH: 114FT.	DPTH TO ∇ 97 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1									
60		1.2/2	0.0		SAND: Light red to reddish brown to grayish orange, fine- to coarse grained, little gravels.		GM		
65		1.0/2	0.0						
70		1.0/2	0.0		SAND: Light red to grayish orange, fine- to coarse-grained, little gravels.				
75		1.0/2	1.0		SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained with moderate gravel.				
80		1.3/2	0.0		SAND: Light red to reddish brown to pinkish gray, fine- to coarse grained with some gravel.				
85		1.7/2	0.0		SAND: Light red to reddish brown, fine- to coarse grained, with moderate gravel, moist throughout.				
90		1.8/2	0.0						
95		2.0/2	0.0		SAND: Light red to reddish brown, fine- to coarse-grained, with moderate gravel, saturated.				
100		2.0/2	0.0		CLAY: Red to gray to white to brown, fine- to medium-grained, stiff.		CH		
105		2.0/2	G.C.						
110		2.0/2	G.C.		SAND: Pale yellowish brown to white to pinkish gray to brown, fine- to coarse-grained, saturated.		GM		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-ID		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM				PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.			DATE STARTED: 3/30/92		COMPLTD: 3/30/92
METHOD: Mud Rotary		CASE SIZE: 488 inches	SCREEN INT.: 100'-114'		PROTECTION LEVEL: D
TOC ELEV.: 164.91 FT.		MONITOR INST.: OVA	TOT DPTH: 114 FT.		DPTH TO ∇ 97 FT.
LOGGED BY: J. Koch		WELL DEVELOPMENT DATE:			SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 2								
115		2.0/2	G.C.	SAND: Moderate pink to light red to pinkish gray, fine- to coarse-grained, saturated.	0 0	GM		
120								
125								
130								
135								
140								
145								
150								
155								
160								
165								

TITLE: NAS Whiting Field				LOG of WELL: WHF-2894-2D		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM						PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.				DATE STARTED: 5/22/92		COMPLTD: 5/22/92	
METHOD: Mud Rotary		CASE SIZE: 4&8 inches		SCREEN INT.: 106'-116'		PROTECTION LEVEL: D	
TOC ELEV.: 167.68 FT.		MONITOR INST.: OVA		TOT DPTH: 117FT.		DPTH TO V 96.9 FT.	
LOGGED BY: A. Stodghill		WELL DEVELOPMENT DATE:				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5						SM	POSTHOLE	
		1.8/2	200.0	SAND: Brown, fine-grained, hard, odor.			6,8,9,8	
10		1.8/2	150.0				3,12,15,14	
15		1.8/2	1000	CLAYEY SAND: Red, dark yellowish orange, grayish orange, very fine-grained, mottled, strong odor.		SC	7,9,13,16	
20		1.8/2	280.0	CLAY: Red, dark yellowish orange, very pale orange, mottled, some fine-grained, strong odor.		CL	5,6,11,13	
25		1.8/2	1000	SANDY CLAY: Brown, red, stiff, clay lenses, strong odor.		SC	6,9,6,8	
30		2.0/2	450.0	SAND: Red, brown, fine- to medium-grained, odor.		SM	11,9,9,9	
35		1.5/2	32.0	SAND: White, fine- to medium-grained, odor.			6,6,7,7	
40		1.5/2	30.0	SAND: White, fine- to medium-grained, odor.			6,7,7,9	
45		0.8/2	10.0	SAND: White, very fine-grained, silt, clay, less odor, damp.			5,6,8,8	
50		1.0/2	1.0	SAND: White, fine- to medium-grained.			-, -,8,10	
55		1.5/2	8.0	SAND: White, medium- to coarse-grained, quartzitic cobbles.		SW	-, -,12,16	
						SP		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-2D		BORING NO.	
CLIENT: SOUTHNAVFACENGCOM				PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.			DATE STARTED: 5/22/92		COMPLTD: 5/22/92
METHOD: Mud Rotary		CASE SIZE: 4&8 inches	SCREEN INT.: 106'-116'		PROTECTION LEVEL: D
TOC ELEV.: 167.68 FT.		MONITOR INST.: OVA	TOT DPTH: 117FT.		DPTH TO ∇ 96.9 FT.
LOGGED BY: A. Stodghill		WELL DEVELOPMENT DATE:			SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
63		1.0/2	14.0	SAND: White, medium-grained.		SP	10,12,15,16	
68		1.2/2	6.0	SAND: Coarse to very coarse-grained, quartzitic cobbles.		SW	12,16,18,18	
73		1.5/2	2.0	SAND: Light grayish orange, fine- to medium-grained.		SM	-, -,22,30	
78		1.6/2	2.0	SAND: Grayish orange and moderate pink, fine- to medium-grained, clayey sand lenses.			-,12,13,22	
83		1.0/2	7.0	SAND: Grayish orange with dark yellowish orange stripes, fine-grained, well-sorted.		ML	50,R	
88		1.8/2	0.0	SAND: Brown, very dark red, grayish orange, very fine- to medium-grained, saturated.			Wt. of Rod	
93		2.0/2	0.0	SAND: Fine-grained (.5'), wet, stiff clay in remainder of spoon.			5,6,8,7	
98		2.0/2	0.0	CLAY: Purple, stiff.		CL	-,10,12,12	
103		2.0/2		CLAY: Light bluish gray and reddish brown, mottled, stiff.			10,21,34,36	
108		1.0/2		CLAY: Light bluish gray and reddish brown, mottled, stiff.			18,16,18,19	
113				SAND: Grayish orange, fine grained, trace clay, minerals, micaceous.		SP		

APPENDIX C

AQUIFER PARAMETER CALCULATIONS AND SLUG TEST DATA

Aquifer Parameter Calculations

Estimates of average pore water velocity were obtained using the following formula:

$$V = (K \cdot i) / n \quad (1)$$

where

V = seepage velocity in feet per day (ft/day),

K = hydraulic conductivity in ft/day,

i = hydraulic gradient, and

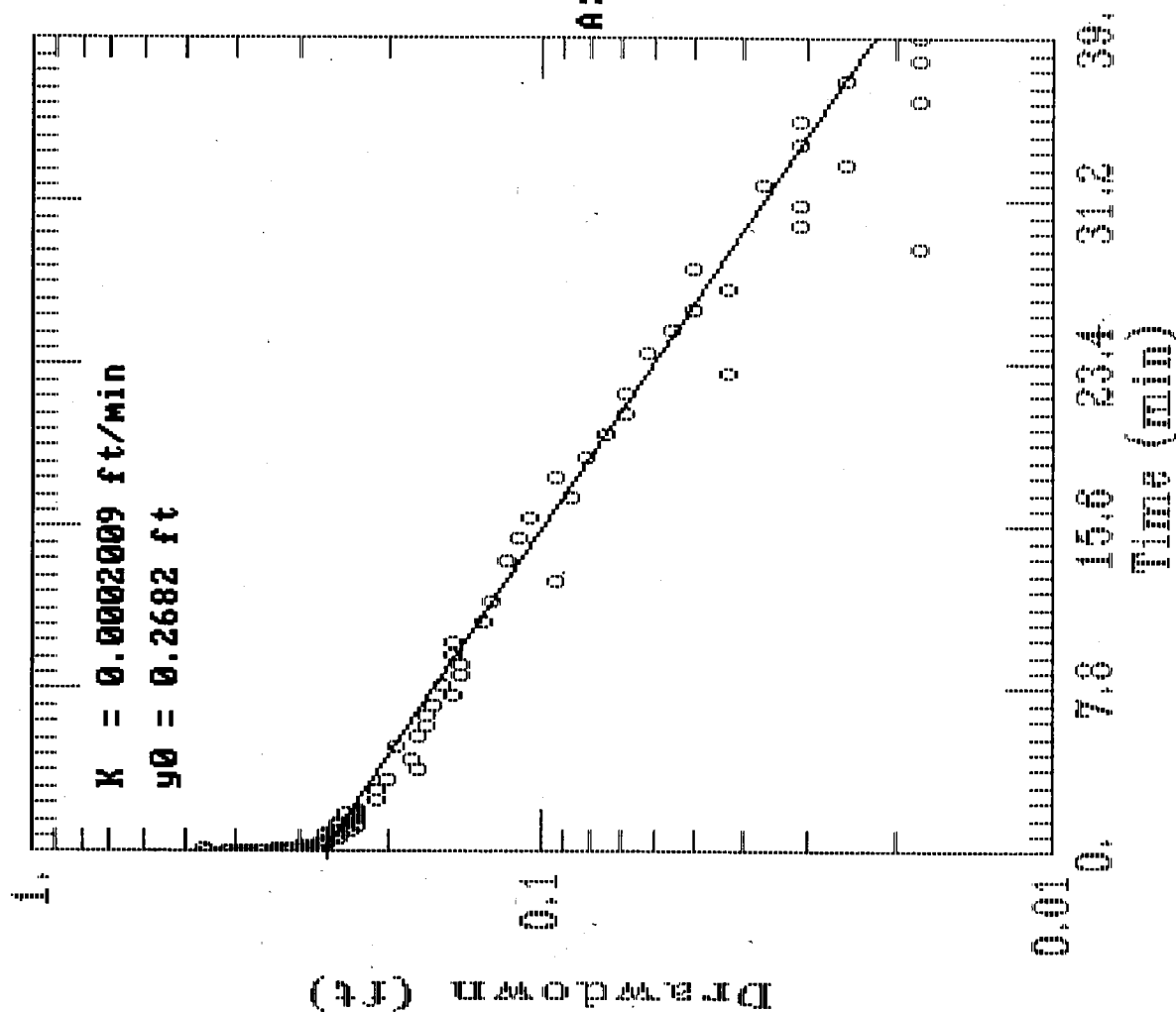
n = estimated porosity.

The effective porosity for silty sands and well sorted sands ranges from 0.18 to 0.27 (Fetter, 1980). An average value for effective porosity of 0.23 was selected for the seepage velocity calculations. The average hydraulic gradient across the site is 1.1×10^{-2} feet per foot (ft/ft), slug test results indicate an average horizontal hydraulic conductivity (K) of 2.5×10^{-3} feet per min (ft/min) (ABB Environmental Services, Inc., 1992b). Using these values, the average pore water velocity was calculated as follows:


$$V = \frac{(2.5 \times 10^{-3} \text{ ft/min} \cdot 1.1 \times 10^{-2} \text{ ft/ft})}{0.23}$$

$$V = 1.2 \times 10^{-4} \text{ ft/min} = .17 \text{ ft/day}$$

NASWF SITE 2894 - WHF-2894-6 RUN 1F



AQTESOLV


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 & MILLER, INC.
 Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

08/03/93

16:52:32

=====
TEST DESCRIPTION
=====

Data set..... A:WF28940.IP
Data set title..... NASWF SITE 2894 - WHF-2894-6 RUN 1F

Knowns and Constants:

No. of data points..... 93
Radius of well casing..... 0.167
Radius of well..... 0.417
Aquifer saturated thickness..... 3.21
Well screen length..... 10
Static height of water in well..... 8.21
Log(Re/Rw)..... 2.255
A, B, C..... 0.000, 0.000, 1.782

=====
ANALYTICAL METHOD
=====

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====
RESULTS FROM VISUAL CURVE MATCHING
=====

VISUAL MATCH PARAMETER ESTIMATES

Estimate
K = 2.2639E-004
y0 = 1.4639E-075

TYPE CURVE DATA

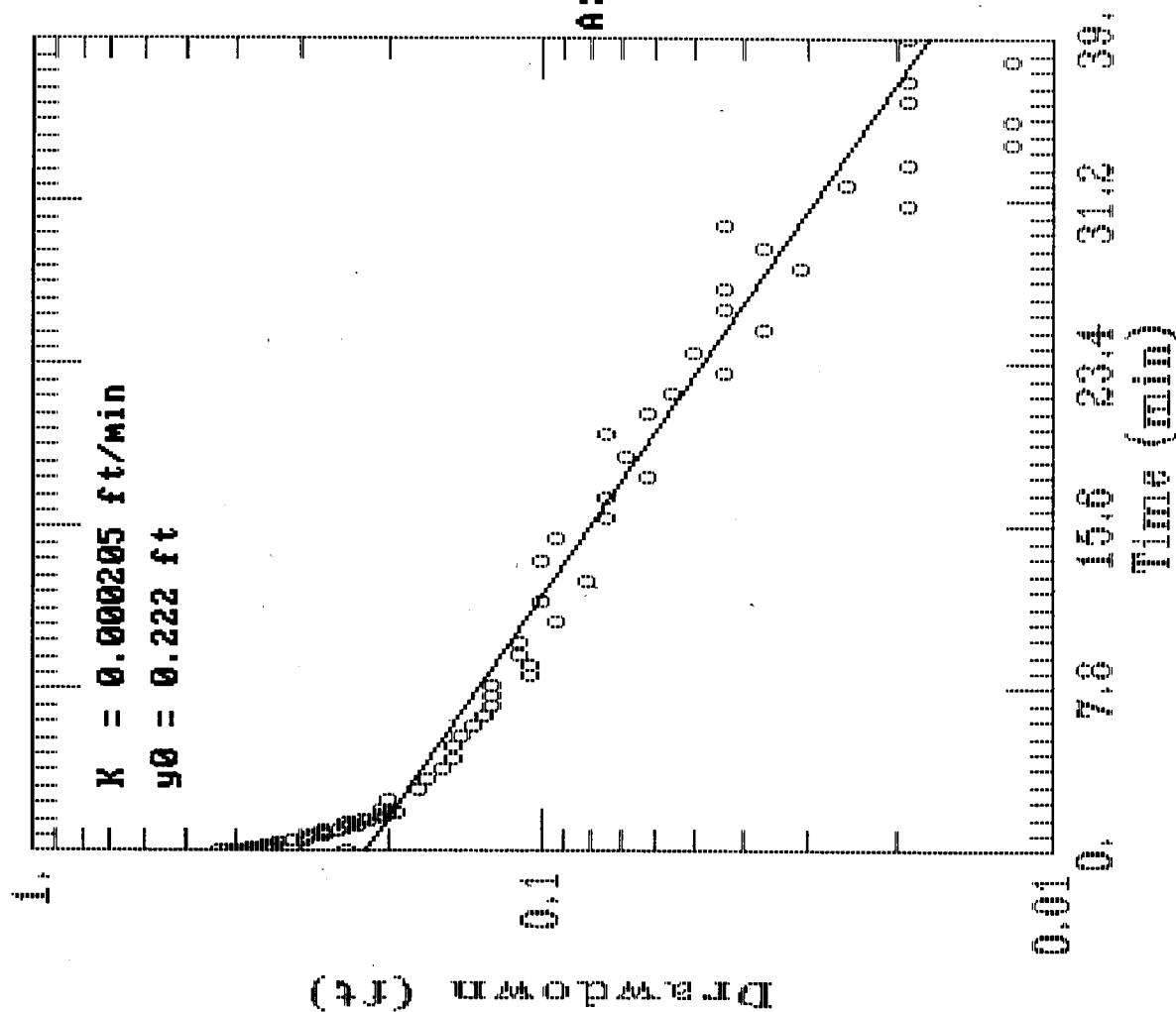
K = 2.26387E-004
y0 = 2.96908E-001

Time	Drawdown	Time	Drawdown	Time	Drawdown
-----	-----	-----	-----	-----	-----
0.000E+000	2.969E-001	3.900E+001	1.792E-002		

TYPE CURVE DATA

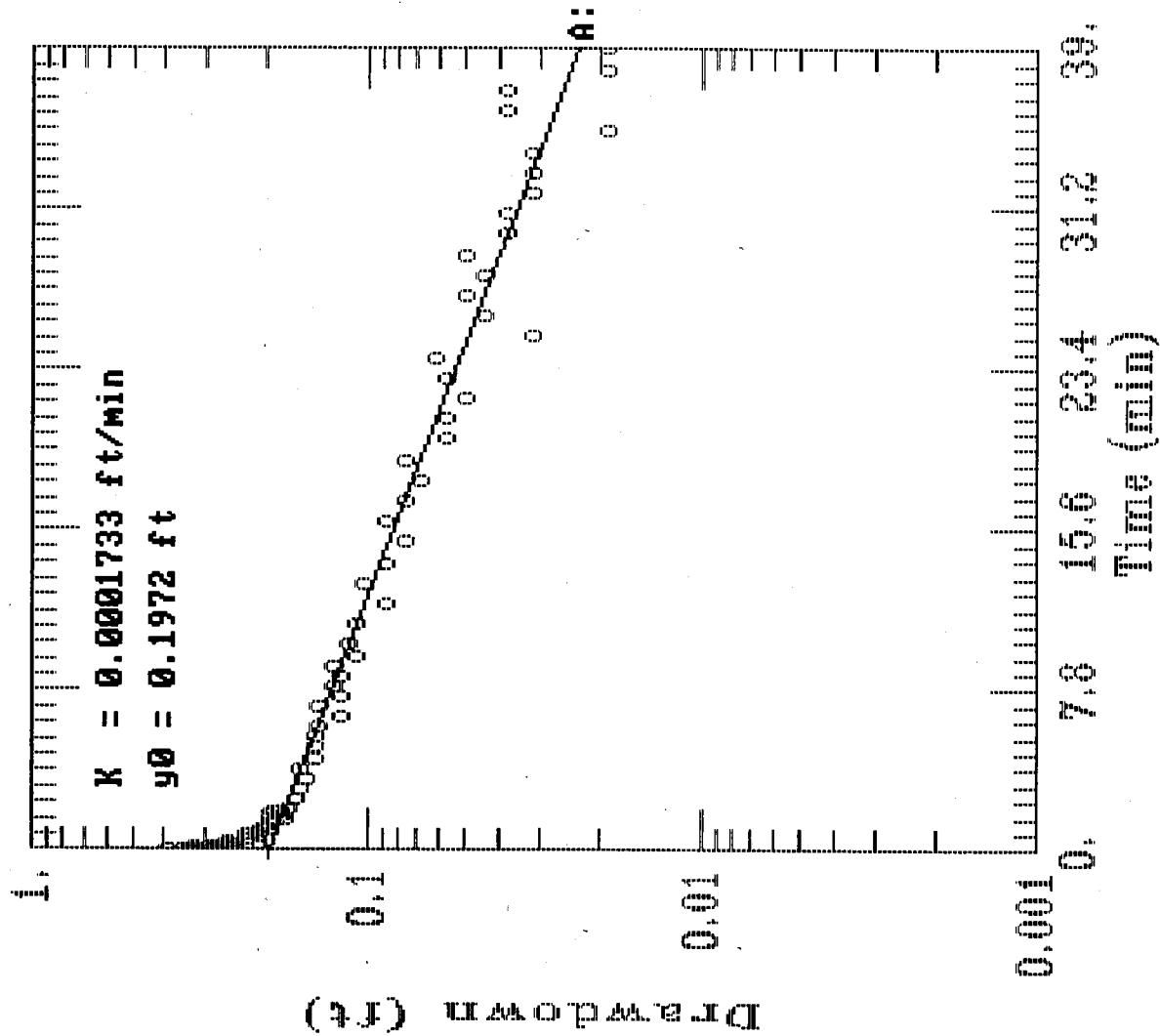
K = 1.91558E-004
y0 = 2.55521E-001

NASWF SITE 2894 - WHF-2894-6 RUN 2R



```
K      = 2.05006E-004
y0    = 2.22024E-001
```

NASWF SITE 2894 - WHF-2894-6 RUN 3F



AQTESOLV

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Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

08/04/93

10:11:34

=====
TEST DESCRIPTION
=====

Data set..... A:\WHITING\WF28942.IP
Data set title..... NASWF SITE 2894 - WHF-2894-6 RUN 3F

Knowns and Constants:

No. of data points..... 102
Radius of well casing..... 0.167
Radius of well..... 0.417
Aquifer saturated thickness..... 3.21
Well screen length..... 10
Static height of water in well..... 8.21
Log (Re/Rw)..... 2.255
A, B, C..... 0.000, 0.000, 1.782

=====
ANALYTICAL METHOD
=====

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====
RESULTS FROM VISUAL CURVE MATCHING
=====

VISUAL MATCH PARAMETER ESTIMATES

Estimate
K = 2.0235E-004
y0 = 6.9315E+234

TYPE CURVE DATA

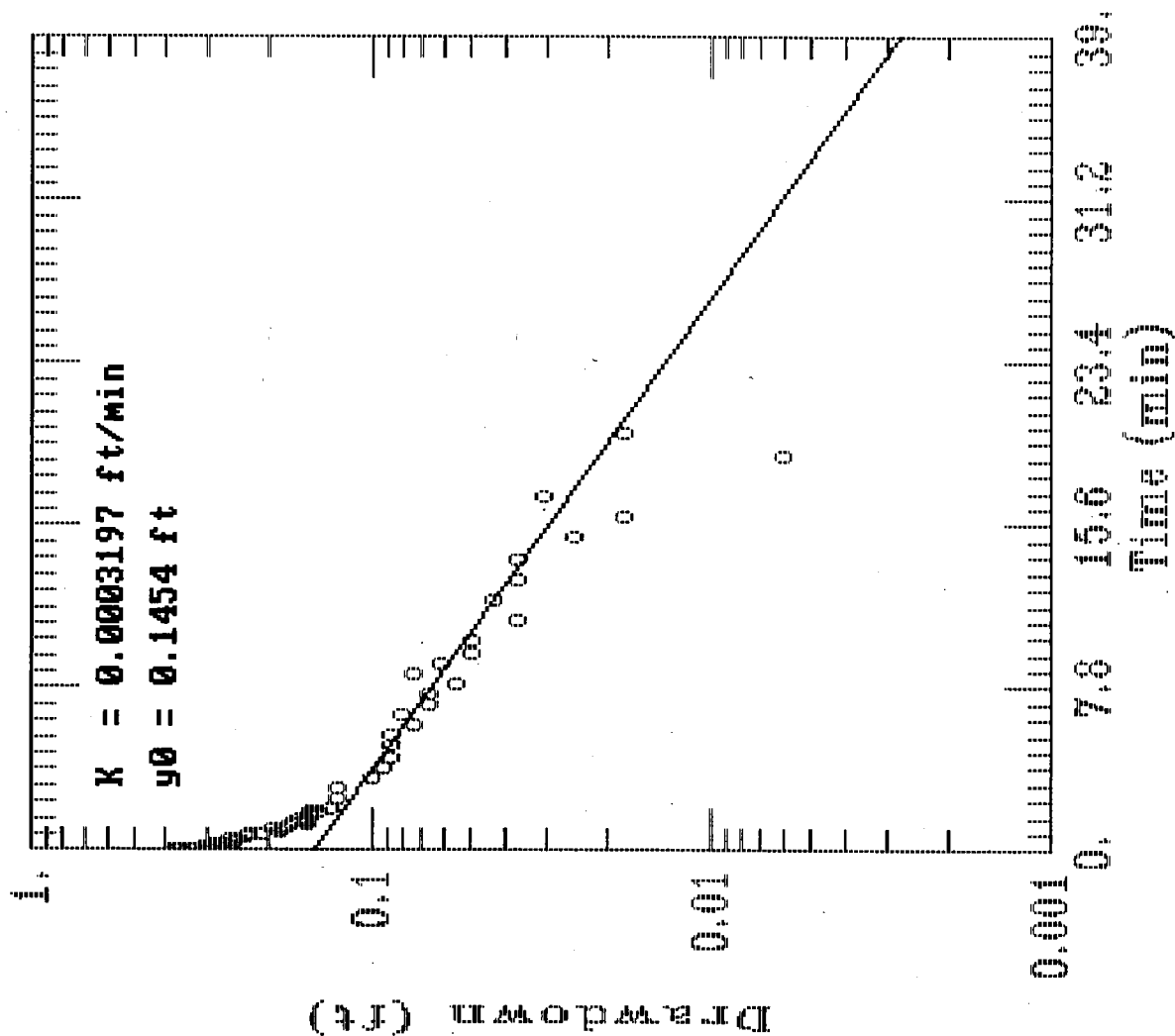
K = 1.73315E-004
y0 = 1.97242E-001

Time	Drawdown	Time	Drawdown	Time	Drawdown
0.000E+000	1.972E-001	3.900E+001	2.299E-002		

TYPE CURVE DATA

K = 1.73315E-004
y0 = 1.97242E-001

NASWF SITE 2894 - WHF-2894-6 RUN 4R



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[illegible]

10:36:13

.....

```
Data set..... WF28943.IP
Data set title.... NASWF SITE 2894 - WHF-2894-6 RUN 4R
```

Knowns and Constants:

No. of data points.....	72		
Radius of well casing.....	0.167		
Radius of well.....	0.417		
Aquifer saturated thickness.....	3.21		
Well screen length.....	10		
Static height of water in well.....	8.21		
Log (Re/Rw)	2.255		
A, B, C.....	0.000,	0.000,	1.782

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Bouwer-Rice (Unconfined Aquifer Slug Test)

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044

VISUAL MATCH PARAMETER ESTIMATES

```

      Estimate
K   =  5.1606E-004
y0  =  6.9315E+234

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[illegible]

TYPE CURVE DATA

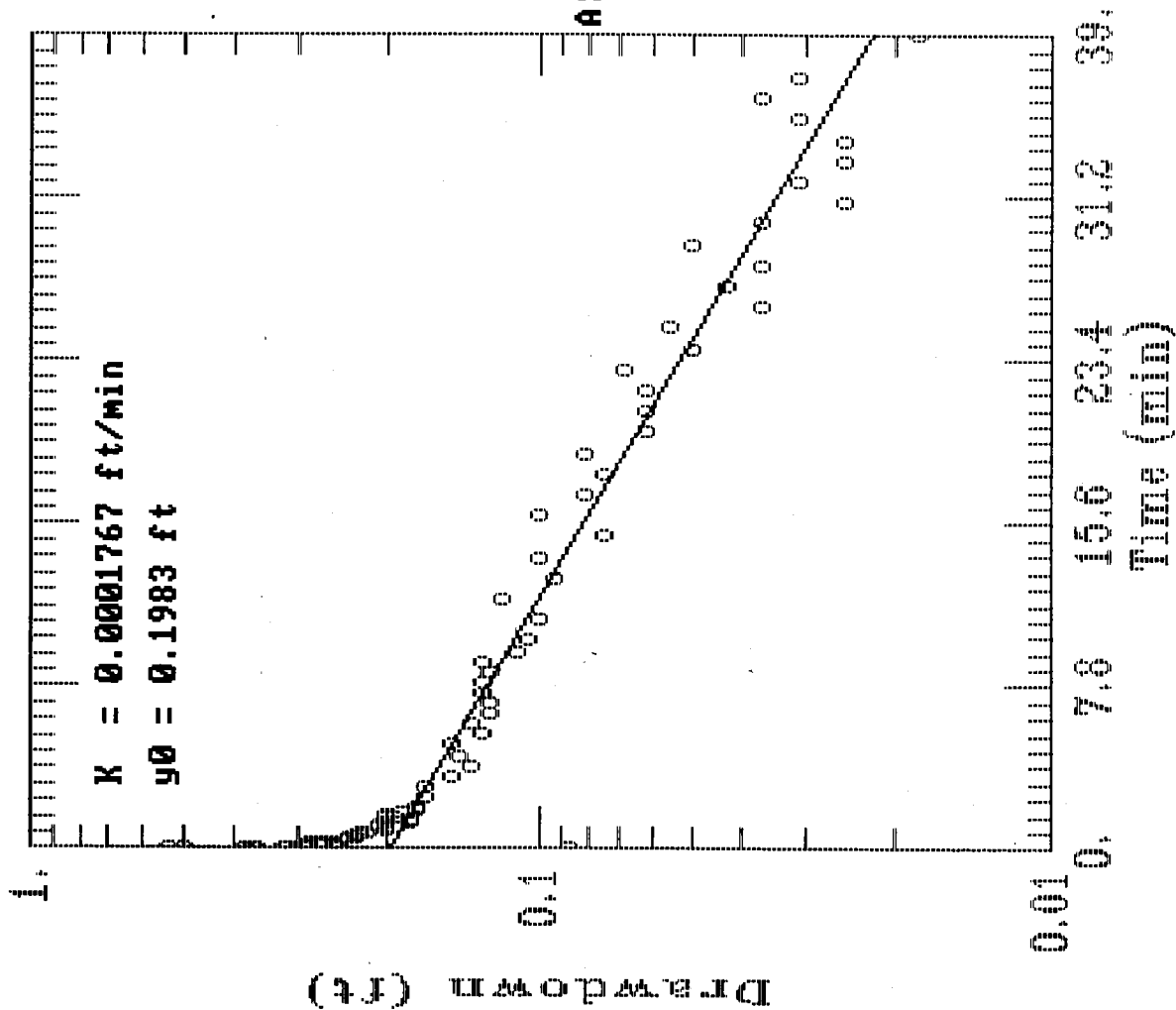
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K      = 3.19717E-004
y0     = 1.45360E-001
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Time	Drawdown	Time	Drawdown	Time	Drawdown
0.000E+000	1.454E-001	3.900E+001	2.757E-003		

TYPE CURVE DATA

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K    = 3.19717E-004
y0   = 1.45360E-001
```

NASWF SITE 2894 - WHF-2894-6 RUN 5F



IP

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Modeling Group

[illegible]

11:00:05

[illegible]

Knowns and Constants:

.....

Bouwer-Rice (Unconfined Aquifer Slug Test)

.....

```

      Estimate
K   = 2.0222E-004
y0  = 6.9315E+234

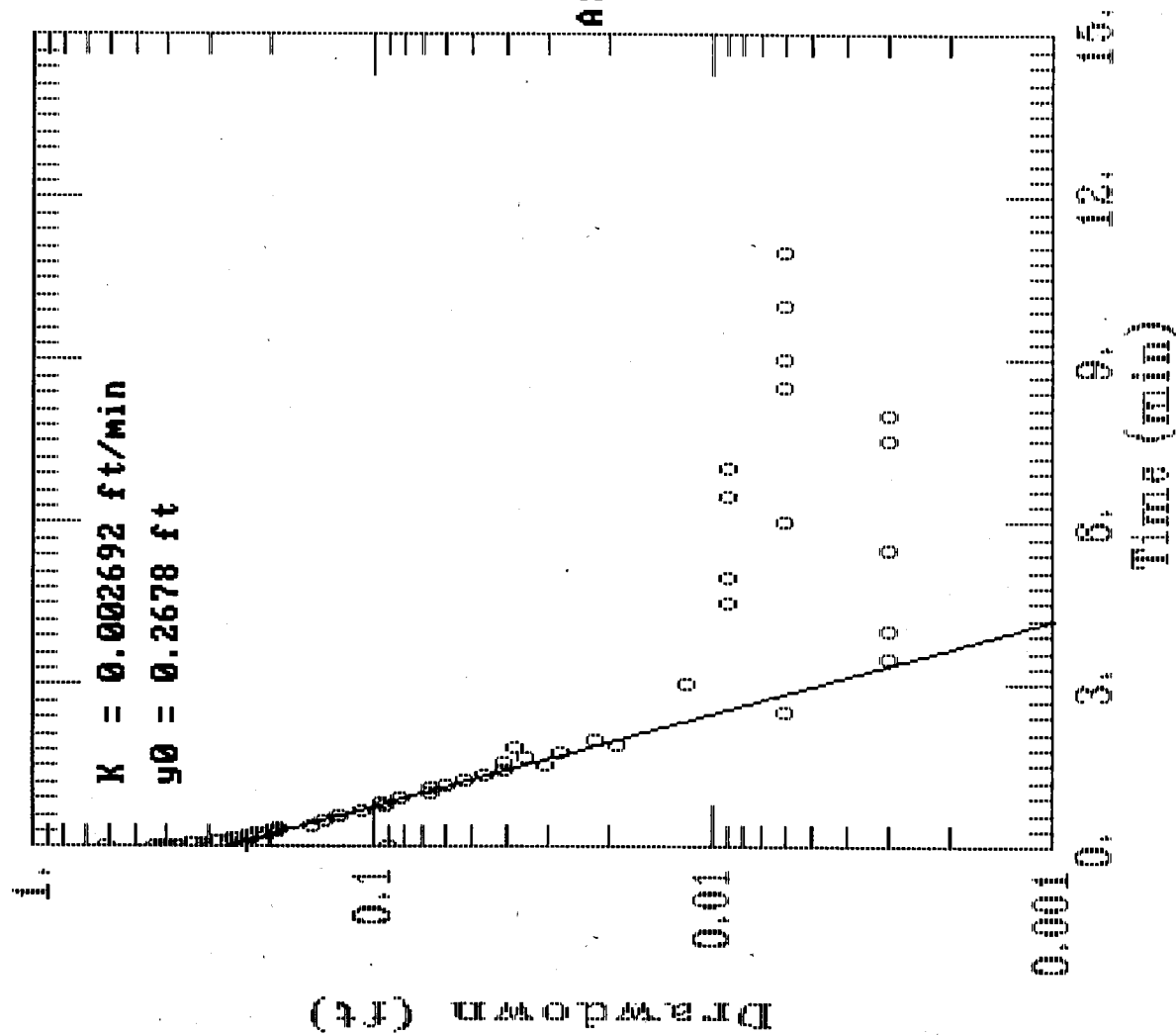
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[illegible]

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K    = 1.76730E-004
y0   = 1.98322E-001
```

Time	Drawdown	Time	Drawdown	Time	Drawdown
0.000E+000	1.983E-001	3.900E+001	2.216E-002		

NASWF SITE 2894 - WHF-2894-7 RUN 6F



AQTESOLV

GERAGHTY
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Modeling Group

[illegible]

11:37:07

.....

```
Data set..... A:\WHITING\WF28945.IP
Data set title.... NASWF SITE 2894 - WHF-2894-7 RUN 6F
```

Knowns and Constants:

No. of data points.....	64		
Radius of well casing.....	0.167		
Radius of well.....	0.417		
Aquifer saturated thickness.....	6.57		
Well screen length.....	15		
Static height of water in well.....	6.57		
Log(Re/Rw).....	2.178		
A, B, C.....	0.000,	0.000,	2.162

[illegible]

Bouwer-Rice (Unconfined Aquifer Slug Test)

.....

VISUAL MATCH PARAMETER ESTIMATES

```

              Estimate
K   =   9.9297E-004
y0  =   1.3016E+041

```

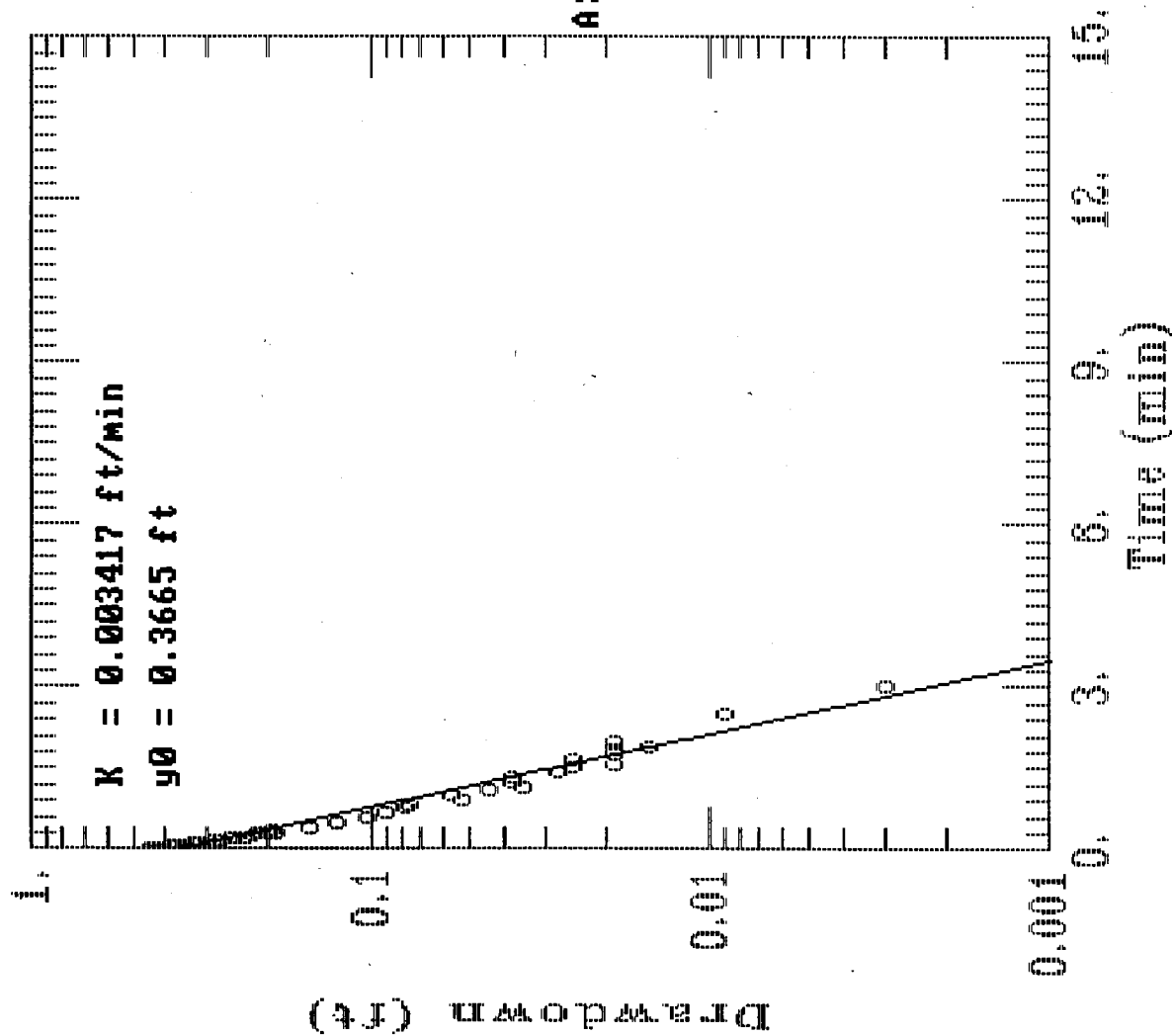
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TYPE CURVE DATA


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K    = 2.69234E-003
y0   = 2.67838E-001
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Time	Drawdown	Time	Drawdown	Time	Drawdown
0.000E+000	2.678E-001	1.500E+001	5.846E-010		

NASWF SITE 2894 - WHF-2894-7 RUN 7R



AQTESOLV


 GERAGHTY
 & MILLER, INC.
 Modeling Group

[illegible]

11:48:17

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044

```
Data set..... A:\WHITING\WF28946.IP
Data set title.... NASWF SITE 2894 - WHF-2894-7 RUN 7R
```

Knowns and Constants:

No. of data points.....	50		
Radius of well casing.....	0.167		
Radius of well.....	0.417		
Aquifer saturated thickness.....	6.57		
Well screen length.....	15		
Static height of water in well.....	6.57		
Log(Re/Rw).....	2.178		
A, B, C.....	0.000,	0.000,	2.162

.....

Bouwer-Rice (Unconfined Aquifer Slug Test)

.....

VISUAL MATCH PARAMETER ESTIMATES

```

      Estimate
K   =  3.4165E-003
y0  =  1.3016E+041

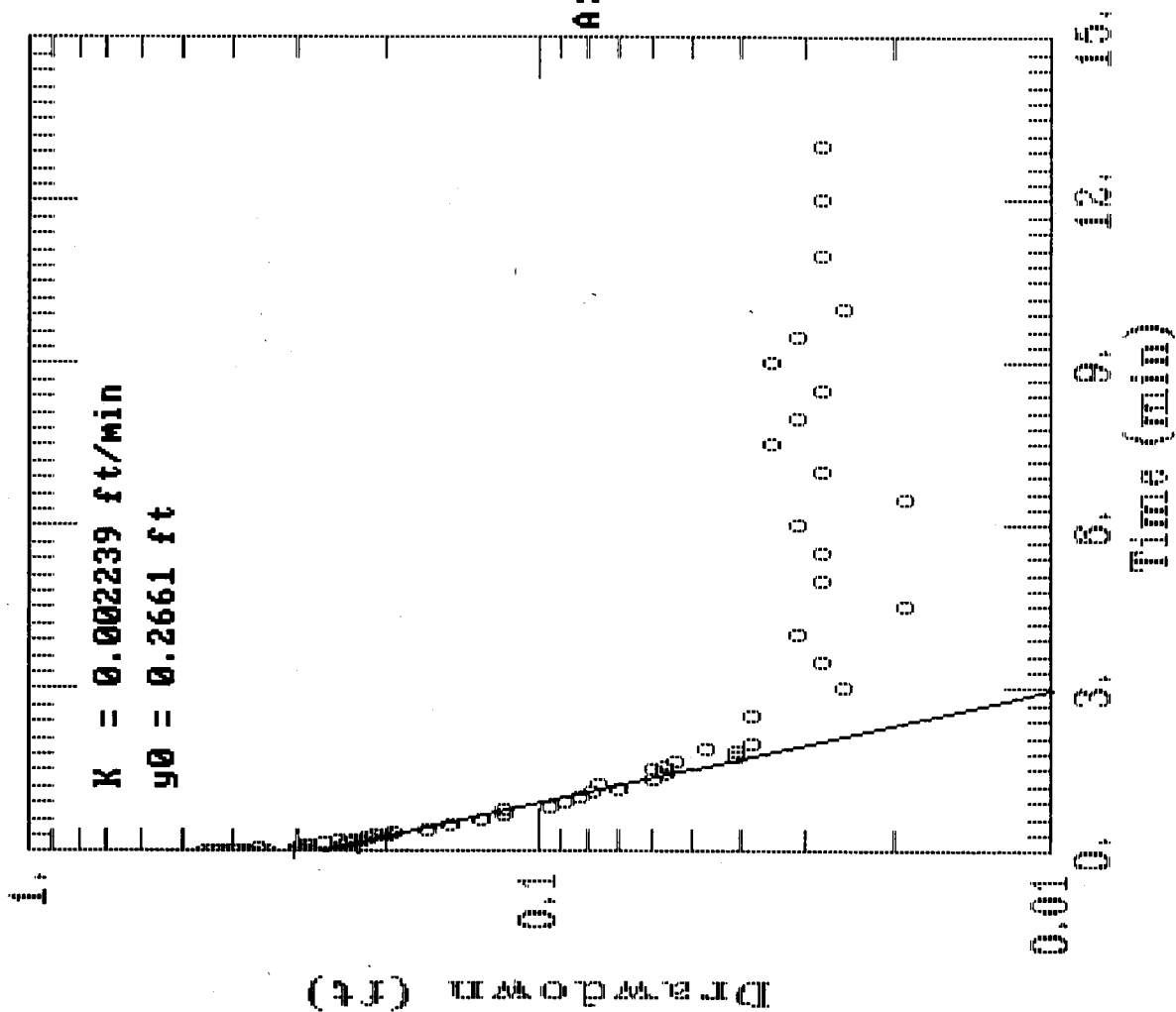
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TYPE CURVE DATA

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K    = 3.41654E-003
y0  = 3.66451E-001
```

Time	Drawdown	Time	Drawdown	Time	Drawdown
0.000E+000	3.665E-001	1.500E+001	3.744E-012		

NASWF SITE 2894 - WHF-2894-7 RUN 8F



AQTESOLV

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[illegible]

12:00:31

.....

```
Data set..... A:\WHITING\WF28947.IP
Data set title.... NASWF SITE 2894 - WHF-2894-7 RUN 8F
```

Knowns and Constants:

No. of data points.....	67		
Radius of well casing.....	0.167		
Radius of well.....	0.417		
Aquifer saturated thickness.....	6.57		
Well screen length.....	15		
Static height of water in well.....	6.57		
Log (Re/Rw)	2.178		
A, B, C.....	0.000,	0.000,	2.162

.....

Bouwer-Rice (Unconfined Aquifer Slug Test)

VISUAL MATCH PARAMETER ESTIMATES

```

      Estimate
K   =  4.6144E-004
y0  =  1.3016E+041

```

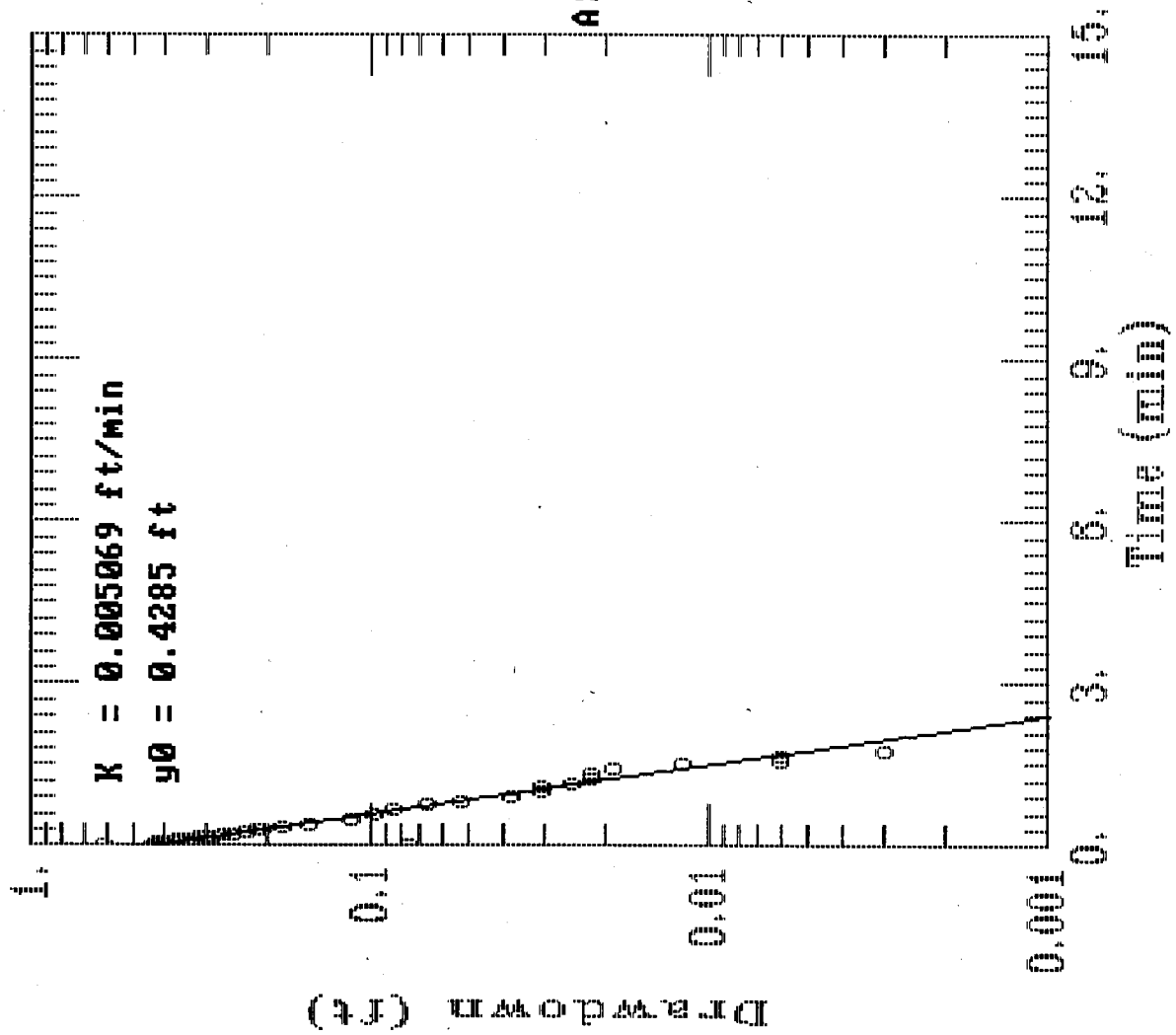
[illegible]

TYPE CURVE DATA


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K    = 2.23858E-003
y0   = 2.66073E-001
```

Time	Drawdown	Time	Drawdown	Time	Drawdown
0.000E+000	2.661E-001	1.500E+001	1.674E-008		

NASWF SITE 2894 - WHF-2894-7 RUN 9R



AQTESOLV


 GERAGHTY
 & MILLER, INC.
 Modeling Group

[illegible]

12:10:02

.....

```
Data set..... A:\WHITING\WF28948.IP
Data set title..... NASWF SITE 2894 - WHF-2894-7 RUN 9R
```

Knowns and Constants:

No. of data points.....	41		
Radius of well casing.....	0.167		
Radius of well.....	0.417		
Aquifer saturated thickness.....	6.57		
Well screen length.....	15		
Static height of water in well.....	6.57		
Log (Re/Rw).....	2.178		
A, B, C.....	0.000,	0.000,	2.162

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044

Bouwer-Rice (Unconfined Aquifer Slug Test)

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VISUAL MATCH PARAMETER ESTIMATES

```

      Estimate
K   =  5.0691E-003
y0  =  1.3016E+041

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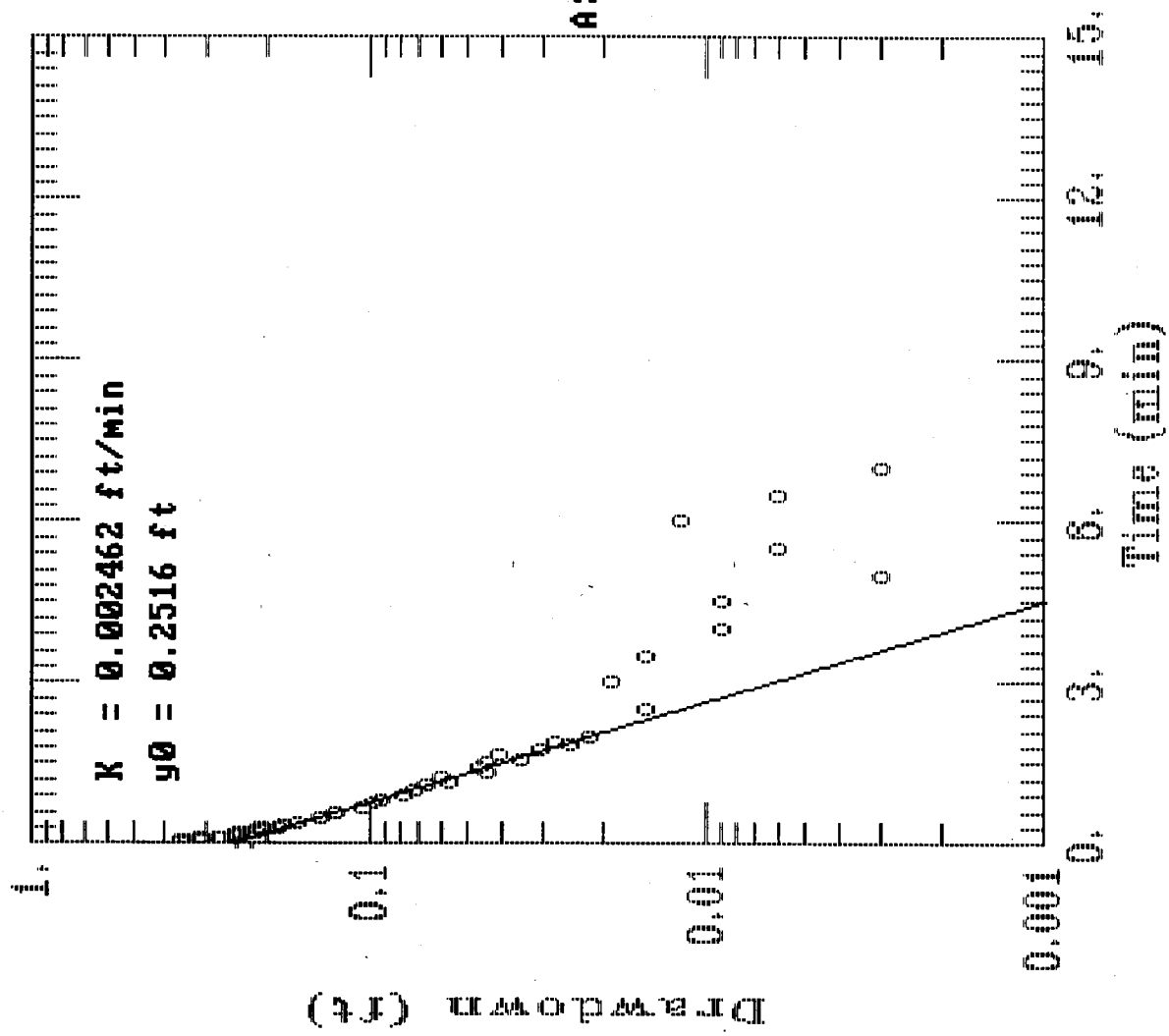
[illegible]

TYPE CURVE DATA

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K    = 5.06907E-003
y0   = 4.28542E-001
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Time	Drawdown	Time	Drawdown	Time	Drawdown
0.000E+000	4.285E-001	1.500E+001	2.115E-017		


NASWF SITE 2894 - WHF-2894-7 RUN 10F



IP

A:

AQTESOLV


**GERAGHTY
& MILLER, INC.**
 Modeling Group

[illegible]

12:27:29

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 104

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Data set..... A:\WHITING\WF28949.IP
Data set title.... NASWF SITE 2894 - WHF-2894-7 RUN 10F
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Knowns and Constants:

No. of data points.....	48		
Radius of well casing.....	0.167		
Radius of well.....	0.417		
Aquifer saturated thickness.....	6.57		
Well screen length.....	15		
Static height of water in well.....	6.57		
Log(Re/Rw).....	2.178		
A, B, C.....	0.000,	0.000,	2.162

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Bouwer-Rice (Unconfined Aquifer Slug Test)

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VISUAL MATCH PARAMETER ESTIMATES

```

              Estimate
K   = 1.3702E-003
y0  = 1.3016E+041

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[illegible]

TYPE CURVE DATA

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K    = 2.46243E-003
y0  = 2.51623E-001

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Time	Drawdown	Time	Drawdown	Time	Drawdown
0.000E+000	2.516E-001	1.500E+001	3.015E-009		

NASWF SITE 2894 - WHF-2894-6 RUN 1F

0.0000	-0.325
0.0033	-0.363
0.0066	-0.306
0.0100	-0.406
0.0133	-0.394
0.0166	-0.413
0.0200	-0.338
0.0233	-0.300
0.0266	-0.375
0.0300	-0.287
0.0333	-0.350
0.0500	-0.331
0.0666	-0.450
0.0833	-0.381
0.1000	-0.294
0.1166	-0.300
0.1333	-0.313
0.1500	-0.319
0.1666	-0.457
0.1833	-0.300
0.2000	-0.331
0.2166	-0.300
0.2333	-0.287
0.2500	-0.300
0.2666	-0.294
0.2833	-0.294
0.3000	-0.300
0.3166	-0.281
0.3333	-0.294
0.4166	-0.262
0.5000	-0.269
0.5833	-0.262
0.6666	-0.250
0.7500	-0.256
0.8333	-0.262
0.9166	-0.262
1.0000	-0.250
1.0833	-0.237
1.1666	-0.244
1.2500	-0.250
1.3333	-0.231
1.4166	-0.250
1.5000	-0.237
1.5833	-0.237
1.6666	-0.231
1.7500	-0.231
1.8333	-0.231
1.9166	-0.244
2.0000	-0.231
2.5000	-0.212

3.0000	-0.212
3.5000	-0.200
4.0000	-0.175
4.5000	-0.181
5.0000	-0.194
5.5000	-0.175
6.0000	-0.169
6.5000	-0.169
7.0000	-0.162
7.5000	-0.150
8.0000	-0.156
8.5000	-0.143
9.0000	-0.143
9.5000	-0.150
10.0000	-0.150
11.0000	-0.131
12.0000	-0.125
13.0000	-0.093
14.0000	-0.118
15.0000	-0.112
16.0000	-0.106
17.0000	-0.087
18.0000	-0.093
19.0000	-0.081
20.0000	-0.075
21.0000	-0.068
22.0000	-0.068
23.0000	-0.043
24.0000	-0.062
25.0000	-0.056
26.0000	-0.050
27.0000	-0.043
28.0000	-0.050
29.0000	-0.018
30.0000	-0.031
31.0000	-0.031
32.0000	-0.037
33.0000	-0.025
34.0000	-0.031
35.0000	-0.031
36.0000	-0.018
37.0000	-0.025
38.0000	-0.018
39.0000	-0.018

NASWF SITE 2894 - WHF-2894-6 RUN 2R

0.0066	0.431
0.0100	0.356
0.0133	0.375
0.0166	0.406
0.0200	0.394
0.0233	0.406
0.0266	0.400
0.0300	0.394
0.0333	0.419
0.0500	0.400
0.0666	0.394
0.0833	0.400
0.1000	0.381
0.1166	0.388
0.1333	0.375
0.1500	0.375
0.1666	0.381
0.1833	0.375
0.2000	0.375
0.2166	0.356
0.2333	0.369
0.2500	0.356
0.2666	0.356
0.2833	0.356
0.3000	0.344
0.3166	0.350
0.3333	0.356
0.4166	0.338
0.5000	0.312
0.5833	0.300
0.6666	0.294
0.7500	0.287
0.8333	0.275
0.9166	0.275
1.0000	0.275
1.0833	0.256
1.1666	0.250
1.2500	0.244
1.3333	0.237
1.4166	0.250
1.5000	0.225
1.5833	0.231
1.6666	0.212
1.7500	0.212
1.8333	0.200
1.9166	0.206
2.0000	0.212
2.5000	0.206
3.0000	0.181
3.5000	0.175
4.0000	0.162

4.5000	0.156
5.0000	0.156
5.5000	0.150
6.0000	0.143
6.5000	0.137
7.0000	0.131
7.5000	0.131
8.0000	0.131
8.5000	0.112
9.0000	0.112
9.5000	0.118
10.0000	0.118
11.0000	0.100
12.0000	0.106
13.0000	0.087
14.0000	0.106
15.0000	0.100
16.0000	0.081
17.0000	0.081
18.0000	0.068
19.0000	0.075
20.0000	0.081
21.0000	0.068
22.0000	0.062
23.0000	0.050
24.0000	0.056
25.0000	0.043
26.0000	0.050
27.0000	0.050
28.0000	0.037
29.0000	0.043
30.0000	0.050
31.0000	0.025
32.0000	0.031
33.0000	0.025
34.0000	0.018
35.0000	0.018
36.0000	0.025
37.0000	0.025
38.0000	0.018
39.0000	0.025
40.0000	0.006
41.0000	0.025
42.0000	0.018
43.0000	0.018
44.0000	0.018
45.0000	0.006
46.0000	0.000

NASWF SITE 2894 - WHF-2894-6 RUN 3F

0.0000	-0.425
0.0033	-0.450
0.0066	-0.381
0.0100	-0.482
0.0133	-0.375
0.0166	-0.419
0.0200	-0.413
0.0233	-0.431
0.0266	-0.413
0.0300	-0.425
0.0333	-0.400
0.0500	-0.319
0.0666	-0.381
0.0833	-0.375
0.1000	-0.350
0.1166	-0.425
0.1333	-0.388
0.1500	-0.419
0.1666	-0.356
0.1833	-0.356
0.2000	-0.369
0.2166	-0.369
0.2333	-0.344
0.2500	-0.338
0.2666	-0.350
0.2833	-0.350
0.3000	-0.344
0.3166	-0.344
0.3333	-0.350
0.4166	-0.350
0.5000	-0.313
0.5833	-0.319
0.6666	-0.306
0.7500	-0.319
0.8333	-0.313
0.9166	-0.306
1.0000	-0.300
1.0833	-0.287
1.1666	-0.294
1.2500	-0.287
1.3333	-0.287
1.4166	-0.281
1.5000	-0.287
1.5833	-0.269
1.6666	-0.275
1.7500	-0.287
1.8333	-0.281
1.9166	-0.275
2.0000	-0.262
2.5000	-0.256
3.0000	-0.250

3.5000	-0.244
4.0000	-0.250
4.5000	-0.237
5.0000	-0.237
5.5000	-0.237
6.0000	-0.231
6.5000	-0.212
7.0000	-0.231
7.5000	-0.212
8.0000	-0.219
8.5000	-0.212
9.0000	-0.219
9.5000	-0.200
10.0000	-0.206
11.0000	-0.200
12.0000	-0.181
13.0000	-0.194
14.0000	-0.181
15.0000	-0.169
16.0000	-0.181
17.0000	-0.169
18.0000	-0.162
19.0000	-0.169
20.0000	-0.150
21.0000	-0.150
22.0000	-0.143
23.0000	-0.150
24.0000	-0.156
25.0000	-0.125
26.0000	-0.137
27.0000	-0.143
28.0000	-0.137
29.0000	-0.143
30.0000	-0.131
31.0000	-0.131
32.0000	-0.125
33.0000	-0.125
34.0000	-0.125
35.0000	-0.112
36.0000	-0.131
37.0000	-0.131
38.0000	-0.112
39.0000	-0.112
40.0000	-0.118
41.0000	-0.100
42.0000	-0.106
43.0000	-0.112
44.0000	-0.093
45.0000	-0.118
46.0000	-0.100
47.0000	-0.106
48.0000	-0.100
49.0000	-0.112

NASWF SITE 2894 - WHF-2894-6 RUN 4R

0	0.532
0.0033	0.469
0.0066	0.394
0.01	0.431
0.0133	0.413
0.0166	0.419
0.02	0.388
0.0233	0.381
0.0266	0.394
0.03	0.388
0.0333	0.381
0.05	0.388
0.0666	0.375
0.0833	0.356
0.1	0.356
0.1166	0.344
0.1333	0.363
0.15	0.356
0.1666	0.35
0.1833	0.331
0.2	0.338
0.2166	0.344
0.2333	0.344
0.25	0.338
0.2666	0.325
0.2833	0.325
0.3	0.325
0.3166	0.319
0.3333	0.325
0.4166	0.3
0.5	0.306
0.5833	0.294
0.6666	0.281
0.75	0.262
0.8333	0.275
0.9166	0.237
1	0.244
1.0833	0.231
1.1666	0.225
1.25	0.219
1.3333	0.206
1.4166	0.206
1.5	0.206
1.5833	0.212
1.6666	0.2
1.75	0.2
1.8333	0.194
1.9166	0.2
2	0.181
2.5	0.175

3	0.175
3.5	0.15
4	0.143
4.5	0.137
5	0.137
5.5	0.137
6	0.125
6.5	0.131
7	0.118
7.5	0.118
8	0.106
8.5	0.125
9	0.112
9.5	0.1
10	0.1
11	0.087
12	0.093
13	0.087
14	0.087
15	0.075
16	0.068
17	0.081
18	0.05
19	0.056
20	0.068
21	0.05
22	0.05

NASWF SITE 2894 - WHF-2894-6 RUN 5F

0.0233	-0.607
0.0266	-0.575
0.0300	-0.457
0.0333	-0.356
0.0500	-0.438
0.0666	-0.438
0.0833	-0.444
0.1000	-0.388
0.1166	-0.394
0.1333	-0.363
0.1500	-0.363
0.1666	-0.363
0.1833	-0.369
0.2000	-0.363
0.2166	-0.356
0.2333	-0.338
0.2500	-0.356
0.2666	-0.350
0.2833	-0.331
0.3000	-0.344
0.3166	-0.338
0.3333	-0.331
0.4166	-0.319
0.5000	-0.313
0.5833	-0.306
0.6666	-0.300
0.7500	-0.300
0.8333	-0.294
0.9166	-0.275
1.0000	-0.269
1.0833	-0.281
1.1666	-0.281
1.2500	-0.275
1.3333	-0.256
1.4166	-0.256
1.5000	-0.269
1.5833	-0.275
1.6666	-0.275
1.7500	-0.262
1.8333	-0.250
1.9166	-0.250
2.0000	-0.250
2.5000	-0.244
3.0000	-0.244
3.5000	-0.225
4.0000	-0.212
4.5000	-0.219
5.0000	-0.225
5.5000	-0.206
6.0000	-0.212

6.5000	-0.200
7.0000	-0.200
7.5000	-0.206
8.0000	-0.206
8.5000	-0.200
9.0000	-0.206
9.5000	-0.187
10.0000	-0.181
11.0000	-0.175
12.0000	-0.194
13.0000	-0.169
14.0000	-0.175
15.0000	-0.150
16.0000	-0.175
17.0000	-0.156
18.0000	-0.150
19.0000	-0.156
20.0000	-0.137
21.0000	-0.137
22.0000	-0.137
23.0000	-0.143
24.0000	-0.125
25.0000	-0.131
26.0000	-0.112
27.0000	-0.118
28.0000	-0.112
29.0000	-0.125
30.0000	-0.112
31.0000	-0.100
32.0000	-0.106
33.0000	-0.100
34.0000	-0.100
35.0000	-0.106
36.0000	-0.112
37.0000	-0.106
38.0000	-0.075
39.0000	-0.093
40.0000	-0.093

NASWF SITE 2894 - WHF-2894-7 RUN 6F

0	0.562
0.0033	0.603
0.0066	0.089
0.01	0.437
0.0133	0.373
0.0166	0.418
0.02	0.399
0.0233	0.437
0.0266	0.37
0.03	0.411
0.0333	0.38
0.05	0.335
0.0666	0.341
0.0833	0.309
0.1	0.293
0.1166	0.277
0.1333	0.268
0.15	0.261
0.1666	0.229
0.1833	0.249
0.2	0.236
0.2166	0.229
0.2333	0.223
0.25	0.22
0.2666	0.201
0.2833	0.197
0.3	0.201
0.3166	0.188
0.3333	0.188
0.4166	0.15
0.5	0.14
0.5833	0.124
0.6666	0.108
0.75	0.092
0.8333	0.095
0.9166	0.083
1	0.067
1.0833	0.067
1.1666	0.06
1.25	0.054
1.3333	0.047
1.4166	0.041
1.5	0.031
1.5833	0.041
1.6666	0.035
1.75	0.028
1.8333	0.038
1.9166	0.019
2	0.022

2.5	0.006
3	0.012
3.5	0.003
4	0.003
4.5	0.009
5	0.009
5.5	0.003
6	0.006
6.5	0.009
7	0.009
7.5	0.003
8	0.003
8.5	0.006
9	0.006

NASWF SITE 2894 - WHF-2894-7 RUN 7R

0.0000	0.446
0.0033	0.446
0.0066	0.440
0.0100	0.440
0.0133	0.431
0.0166	0.424
0.0200	0.427
0.0233	0.427
0.0266	0.411
0.0300	0.408
0.0333	0.411
0.0500	0.386
0.0666	0.370
0.0833	0.354
0.1000	0.338
0.1166	0.325
0.1333	0.316
0.1500	0.290
0.1666	0.287
0.1833	0.274
0.2000	0.258
0.2166	0.255
0.2333	0.236
0.2500	0.223
0.2666	0.223
0.2833	0.217
0.3000	0.201
0.3166	0.191
0.3333	0.194
0.4166	0.150
0.5000	0.124
0.5833	0.102
0.6666	0.089
0.7500	0.079
0.8333	0.076
0.9166	0.054
1.0000	0.057
1.0833	0.044
1.1666	0.035
1.2500	0.038
1.3333	0.038
1.4166	0.028
1.5000	0.025
1.5833	0.019
1.6666	0.025
1.7500	0.019
1.8333	0.019
1.9166	0.015
2.0000	0.019
2.5000	0.009
3.0000	0.003

NASWF SITE 2894 - WHF-2894-7 RUN 8F

0.0000	-0.411
0.0033	-0.370
0.0066	-0.239
0.0100	-0.437
0.0133	-0.424
0.0166	-0.453
0.0200	-0.293
0.0233	-0.402
0.0266	-0.395
0.0300	-0.341
0.0333	-0.383
0.0500	-0.351
0.0666	-0.300
0.0833	-0.293
0.1000	-0.290
0.1166	-0.284
0.1333	-0.242
0.1500	-0.229
0.1666	-0.265
0.1833	-0.239
0.2000	-0.245
0.2166	-0.223
0.2333	-0.229
0.2500	-0.220
0.2666	-0.213
0.2833	-0.210
0.3000	-0.197
0.3166	-0.204
0.3333	-0.194
0.4166	-0.166
0.5000	-0.150
0.5833	-0.130
0.6666	-0.118
0.7500	-0.118
0.8333	-0.095
0.9166	-0.089
1.0000	-0.083
1.0833	-0.079
1.1666	-0.070
1.2500	-0.076
1.3333	-0.060
1.4166	-0.057
1.5000	-0.060
1.5833	-0.057
1.6666	-0.054
1.7500	-0.041
1.8333	-0.041
1.9166	-0.047
2.0000	-0.038
2.5000	-0.038
3.0000	-0.025

3.5000	-0.028
4.0000	-0.031
4.5000	-0.019
5.0000	-0.028
5.5000	-0.028
6.0000	-0.031
6.5000	-0.019
7.0000	-0.028
7.5000	-0.035
8.0000	-0.031
8.5000	-0.028
9.0000	-0.035
9.5000	-0.031
10.0000	-0.025
11.0000	-0.028
12.0000	-0.028
13.0000	-0.028

NASWF SITE 2894 - WHF-2894-7 RUN 9R

0.0200	0.612
0.0233	0.402
0.0266	0.418
0.0300	0.427
0.0333	0.431
0.0500	0.424
0.0666	0.405
0.0833	0.383
0.1000	0.373
0.1166	0.344
0.1333	0.328
0.1500	0.319
0.1666	0.303
0.1833	0.284
0.2000	0.274
0.2166	0.255
0.2333	0.252
0.2500	0.236
0.2666	0.226
0.2833	0.217
0.3000	0.204
0.3166	0.204
0.3333	0.181
0.4166	0.150
0.5000	0.114
0.5833	0.098
0.6666	0.086
0.7500	0.067
0.8333	0.054
0.9166	0.038
1.0000	0.031
1.0833	0.031
1.1666	0.025
1.2500	0.022
1.3333	0.022
1.4166	0.019
1.5000	0.012
1.5833	0.006
1.6666	0.006
1.7500	0.003

NASWF SITE 2894 - WHF-2894-7 RUN 10F

0.0500	-0.364
0.0666	-0.348
0.0833	-0.316
0.1000	-0.274
0.1166	-0.280
0.1333	-0.316
0.1500	-0.255
0.1666	-0.252
0.1833	-0.239
0.2000	-0.245
0.2166	-0.229
0.2333	-0.217
0.2500	-0.213
0.2666	-0.210
0.2833	-0.210
0.3000	-0.204
0.3166	-0.185
0.3333	-0.181
0.4166	-0.162
0.5000	-0.140
0.5833	-0.124
0.6666	-0.105
0.7500	-0.098
0.8333	-0.092
0.9166	-0.079
1.0000	-0.073
1.0833	-0.067
1.1666	-0.057
1.2500	-0.060
1.3333	-0.044
1.4166	-0.047
1.5000	-0.044
1.5833	-0.035
1.6666	-0.041
1.7500	-0.031
1.8333	-0.025
1.9166	-0.028
2.0000	-0.022
2.5000	-0.015
3.0000	-0.019
3.5000	-0.015
4.0000	-0.009
4.5000	-0.009
5.0000	-0.003
5.5000	-0.006
6.0000	-0.012
6.5000	-0.006
7.0000	-0.003

APPENDIX D

ANALYTICAL RESULTS



WADSWORTH/ALERT Laboratories

Division of Ensco Incorporated

5910 Breckenridge Parkway, Suite H
Tampa, FL 33610

813-621-0784
FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: 1-08-134

TASK ORDER NUMBER: 0013

NAS WHITING FIELD

MILTON, FLORIDA

Presented to:

PETER REDFERN

ABB ENVIRONMENTAL SERVICES, INC.

WADSWORTH/ALERT LABORATORIES

5910 BRECKENRIDGE PARKWAY, SUITE H

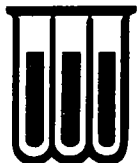
TAMPA, FL 33610

(813) 621-0784

**Dan Henson
Project Manager**

**Randall C. Grubbs
Laboratory Director - Florida**

September 2, 1992



WADSWORTH/ALERT
LABORATORIES

INVOLVEMENT

This report summarizes the analytical results of the NAS Whiting Field, Milton, FL site submitted by ABB Environmental Services, Inc. to Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Peter Redfern. The samples were accepted into Wadsworth's Florida facility on 18 August 1992, in accordance with documented sample acceptance procedures. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



WADSWORTH/ALERT
LABORATORIES

ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER	METHOD

ORGANICS	
Volatile Organics	** EPA Method 601/2
Ethylene Dibromide	** EPA Method 601 Mod.
Polynuclear Aromatic Hydrocarbons	** EPA Method 625
METALS	
Lead	** EPA Method 239.2
MISCELLANEOUS	
Tot. Rec. Petroleum Hydrocarbons	** EPA Method 418.1

NOTE: ** Indicates usage of this method to obtain results for this report.

(D) Indicates draft version of this method was used

EPA Methods Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982

Std. Methods Drinking Waters USEPA, 600/4-88/039, December, 1988.

USEPA Methods Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.

SW846 Methods From 40CFR Part 136, published in Federal Register on October 26, 1984.

ASTM Methods Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition, USEPA, 1986.

NIOSH Method American Society for Testing and Materials.

NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-6
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/20/92

SAMPLE ID: WHF-2894-5

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	103	(78-122)
Trifluorotoluene (PID)	100	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-6
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: WHF-2894-5

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		
	WATER	SOLID	%
Bromoform (ECD)	(41-152)	(41-152)	77



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-6
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

SAMPLE ID: WHF-2894-5

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1,2,3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	69	(22-135)	(10-155)
Fluorobiphenyl	76	(34-140)	(12-153)
Terphenyl-d14	103	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-6
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-5

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	8/24- 8/25/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-6
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-5

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1 mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-7
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/20/92

SAMPLE ID: WHF-2894-6

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	99	(78-122)
Trifluorotoluene (PID)	99	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-7
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: WHF-2894-6

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	83



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-7
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

SAMPLE ID: WHF-2894-6

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	64	(22-135)	(10-155)
Fluorobiphenyl	78	(34-140)	(12-153)
Terphenyl-d14	102	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-7
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-6

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	8/24- 8/25/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-7
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-6

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-8
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/20/92

SAMPLE ID: DUPLICATE #1

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	99	(78-122)
Trifluorotoluene (PID)	101	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-8
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: DUPLICATE #1

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	91



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-3
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/20/92

SAMPLE ID: WHF-2894-2D

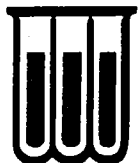
VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	105	(78-122)
Trifluorotoluene (PID)	102	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-3
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: WHF-2894-2D

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	94



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-3
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

SAMPLE ID: WHF-2894-2D

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	64	(22-135)	(10-155)
Fluorobiphenyl	76	(34-140)	(12-153)
Terphenyl-d14	100	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-3
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-2D

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	8/24- 8/25/92	ND	5 ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-3
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-2D

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1 mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-8
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

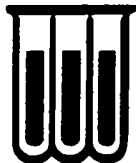
SAMPLE ID: DUPLICATE #1

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	63	(22-135)	(10-155)
Fluorobiphenyl	74	(34-140)	(12-153)
Terphenyl-d14	105	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2H1801-8
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : DUPLICATE #1

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	8/24- 8/25/92	ND	5 ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2H1801-8
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : DUPLICATE #1

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1 mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-4
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/20/92

SAMPLE ID: WHF-2894-3

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	105	(78-122)
Trifluorotoluene (PID)	100	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-4
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: WHF-2894-3

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	0.09	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	500



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-4
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

SAMPLE ID: WHF-2894-3

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	69	(22-135)	(10-155)
Fluorobiphenyl	80	(34-140)	(12-153)
Terphenyl-d14	114	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-4
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-3

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	8/24- 8/25/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-4
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-3

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1 mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-2
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/20/92

SAMPLE ID: WHF-2894-2

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	94	(78-122)
Trifluorotoluene (PID)	100	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-2
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: WHF-2894-2

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	98



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-2
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

SAMPLE ID: WHF-2894-2

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	58	(22-135)	(10-155)
Fluorobiphenyl	73	(34-140)	(12-153)
Terphenyl-d14	103	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-2
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-2

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	8/24- 8/25/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-2
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-2

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-1
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/20/92

SAMPLE ID: WHF-2894-1D

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	97	(78-122)
Trifluorotoluene (PID)	102	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-1
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: WHF-2894-1D

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	78



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-1
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

SAMPLE ID: WHF-2894-1D

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	69	(22-135)	(10-155)
Fluorobiphenyl	82	(34-140)	(12-153)
Terphenyl-d14	100	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-1
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-1D

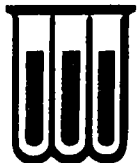
METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	8/24- 8/25/92	ND	5 ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-1
MATRIX : WATER

DATE RECEIVED: 8/18/92

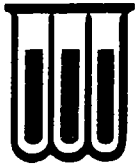
SAMPLE ID : WHF-2894-1D

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	8/28/92	2	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-5
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/20/92

SAMPLE ID: WHF-2894-4

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	101	(78-122)
Trifluorotoluene (PID)	99	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-5
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: WHF-2894-4

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	88



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-5
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

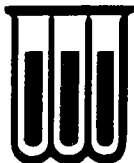
SAMPLE ID: WHF-2894-4

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	65	(22-135)	(10-155)
Fluorobiphenyl	79	(34-140)	(12-153)
Terphenyl-d14	99	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2H1801-5
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-4

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	8/24- 8/25/92	ND	5 ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-5
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : WHF-2894-4

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1 mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-9
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: EQUIPMENT BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY: %
Bromochloromethane (HECD) 101
Trifluorotoluene (PID) 100

ACCEPTABLE LIMITS
(78-122)
(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-9
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/25/92

SAMPLE ID: EQUIPMENT BLANK

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	94



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-9
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

SAMPLE ID: EQUIPMENT BLANK

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS HRS84297
METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	55	(22-135)	(10-155)
Fluorobiphenyl	60	(34-140)	(12-153)
Terphenyl-d14	93	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-9
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : EQUIPMENT BLANK

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	8/24- 8/25/92	ND	5 ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2H1801-9
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : EQUIPMENT BLANK

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1 mg/L

NOTE: ND (None Detected) .



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-10
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: FIELD BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	97	(78-122)
Trifluorotoluene (PID)	102	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-10
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/25/92

SAMPLE ID: FIELD BLANK

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	88



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-10
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/25/92

SAMPLE ID: FIELD BLANK

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS HRS84297
METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	57	(22-135)	(10-155)
Fluorobiphenyl	70	(34-140)	(12-153)
Terphenyl-d14	105	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2H1801-10
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : FIELD BLANK

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	8/24- 8/25/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-10
MATRIX : WATER

DATE RECEIVED: 8/18/92

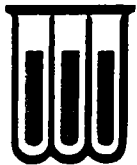
SAMPLE ID : FIELD BLANK

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1 mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-11
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: TRIP BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	107	(78-122)
Trifluorotoluene (PID)	101	(73-131)



WADSWORTH/ALERT
LABORATORIES

QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



WADSWORTH/ALERT
LABORATORIES

QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical method performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

Volatiles

Methylene chloride
Toluene
2-Butanone
Acetone

Semi-volatiles

Dimethyl phthalate
Diethyl phthalate
Di-n-butyl phthalate
Butyl benzyl phthalate
Bis (2-ethylhexyl) phthalate

Metals

Calcium
Magnesium
Sodium

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



WADSWORTH/ALERT
LABORATORIES

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY
(cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery

determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. Actual percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

*****EXAMPLE*****

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT	0	95	112	16	22	66-119
Benzene	10	86	93	8	20	39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.		accep. method perform range

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

J - indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).

B - indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.

DIL - indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-BK
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/20/92

SAMPLE ID: LABORATORY BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	98	(78-122)
Trifluorotoluene (PID)	99	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-BK
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: LABORATORY BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	111	(78-122)
Trifluorotoluene (PID)	101	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2H1801-BK
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/28/92

SAMPLE ID: LABORATORY BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	102	(78-122)
Trifluorotoluene (PID)	101	(73-131)



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-BK
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 8/21/92

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene Dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	102



WADSWORTH/ALERT
LABORATORIES

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-BK
MATRIX: WATER

DATE RECEIVED: 8/18/92
DATE EXTRACTED: 8/19/92
DATE ANALYZED: 8/22/92

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	43	(22-135)	(10-155)
Fluorobiphenyl	70	(34-140)	(12-153)
Terphenyl-d14	135	(10-132)	(13-140)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-BK
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : LABORATORY BLANK

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	8/24- 8/25/92	ND	5 ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2H1801-BK
MATRIX : WATER

DATE RECEIVED: 8/18/92

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	8/28/92	ND	1 mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT
LABORATORIES

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : 2A534/2B534

DATE EXTRACTED: N/A
DATE ANALYZED : 08/20/92

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Benzene	2A534/2B534	112	15 70-117
Toluene		110	16 70-117
Chlorobenzene		103	24 58-133
1,1-Dichloroethene		112	28 43-131
Trichloroethene		111	13 75-123
Dichlorobromomethane		115	22 61-133



WADSWORTH/ALERT
LABORATORIES

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : 2A547/2B547

DATE EXTRACTED: N/A
DATE ANALYZED : 08/21/92

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Benzene	2A547/2B547	105	15 70-117
Toluene		101	16 70-117
Chlorobenzene		96	24 58-133
1,1-Dichloroethene		102	28 43-131
Trichloroethene		101	13 75-123
Dichlorobromomethane		97	22 61-133



WADSWORTH/ALERT
LABORATORIES

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : 2A561/2B561

DATE EXTRACTED: N/A
DATE ANALYZED : 08/28/92

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Benzene	2A561/2B561	107	15 70-117
Toluene		105	16 70-117
Chlorobenzene		98	24 58-133
1,1-Dichloroethene		99	28 43-131
Trichloroethene		104	13 75-123
Dichlorobromomethane		110	22 61-133



WADSWORTH/ALERT
LABORATORIES

LAB ID : LCS
MATRIX : WATER
METHOD : 601 MOD.
RUN ID : 80

DATE EXTRACTED: NA
DATE ANALYZED : 08/21/92

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS	
			RPD	%REC
Ethylene Dibromide	80	105	25	81-135



WADSWORTH/ALERT
LABORATORIES

LAB ID : LCS
MATRIX : WATER
METHOD : 601 Mod.
RUN ID : 93

DATE EXTRACTED: NA
DATE ANALYZED : 08/25/92

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Ethylene Dibromide	93	103	25 81-135



WADSWORTH/ALERT
LABORATORIES

LAB ID: LCS
MATRIX: WATER
METHOD: 625

DATE EXTRACTED: 08/19/92
DATE ANALYZED: 08/22/92

LABORATORY CHECK SAMPLE RECOVERY

COMPOUND	LCS %REC	QC LIMITS RECOVERY
Acenaphthene	106	45-130
Pyrene	130	20-144



WADSWORTH/ALERT
LABORATORIES

LAB ID : LCS

MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
METALS

ELEMENT	DATE	DATE	LCS	QC LIMITS	
	PREPARED	ANALYZED	%REC	RPD	%REC
Lead (furnace)	08/24/92	08/25/92	94	33	64-132

LCS



WADSWORTH/ALERT
LABORATORIES

LAB ID : LCS

MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	08/28/92	08/28/92	102	24 75-124	LCS



WADSWORTH/ALERT
LABORATORIES

LAB ID : 2H1801-7
MATRIX : WATER
METHOD : 601/2
RUN ID : 2A563/2B563

DATE RECEIVED : 08/18/92
DATE PREPARED : N/A
DATE ANALYZED : 08/28/92

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
1,1-Dichloroethene	2A563/2B563	109	99	10	28 43-131
Trichloroethene		96	108	12	13 75-123
Chlorobenzene		89	96	8	24 58-133
Toluene		96	104	8	16 70-117
Benzene		98	106	8	15 70-117
Dichlorobromomethane		103	115	11	22 61-133

* = Diluted Out



WADSWORTH/ALERT
LABORATORIES

LAB ID : 2H1801-5
MATRIX : WATER
METHOD : 601 MOD.
RUN ID : 95

DATE RECEIVED : 08/18/92
DATE PREPARED : N/A
DATE ANALYZED : 08/25/92

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Ethylene Dibromide	95	71	71	0	25 81-135

* = Diluted Out



WADSWORTH/ALERT
LABORATORIES

LAB ID: 2H1801-9
MATRIX: WATER
METHOD: 625

DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/19/92
DATE ANALYZED: 08/25/92

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	MS %REC	MSD %REC	RPD	QC LIMITS RPD RECOVERY
Acenaphthene	107	101	6	24 57-104
Pyrene	93	94	1	30 58-148

**WADSWORTH/ALERT LABORATORIES
SAMPLE SHIPPER EVALUATION AND RECEIPT FORM**

Client: ABB Env. Project Name/Number: NAS Whiting

Samples Received By: R. G. Gibbs Date Received: 8-18-92
(Signature)

Sample Evaluation Form By: [Signature] LAB No: _____
(Signature)

Type of shipping container samples received in? WAL Cooler ☒

Client Cooler ☐ WAL Shipper ☐ Box ☐ Other ☐

Any "NO" responses or discrepancies should be explained in comments section.

- | | YES | NO |
|--|-------------------------------------|--------------------------|
| 1. Were custody seals on shipping container(s) intact? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Were custody papers properly included with samples? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Were custody papers properly filled out (ink, signed, match labels)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Did all bottles arrive in good condition (unbroken)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Were all bottle labels complete (Sample No., date, signed, analysis preservatives)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Were correct bottles used for the tests indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Were proper sample preservation techniques indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8. Were samples received within adequate holding time? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 9. Were all VOA bottles checked for the presence of air bubbles? (If air bubbles were found indicate in comment section) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10. Were samples in direct contact with wet ice? (NOTE TEMPERATURE BELOW) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 11. Were samples accepted into the laboratory? (If no see comments) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler # 48-66 Temp 3.5 °C Cooler # — Temp 9.0 °C

Cooler # 48-77 Temp 4.1 °C Cooler # 48-122 Temp 6.3 °C

Cooler # 48-137 Temp 5.2 °C

Comments: All VOA's in #48-66



WADSWORTH/ALERT
LABORATORIES
Sampling, testing, mobile labs

5910 Breckenridge Pkwy.
Suite H
Tampa, FL 33610

(813) 621-0784
Fax (813) 623-6021

Chain of Custody Record

ST17/MT15
ST16/MT1801-

Record # 11019 of 1

Client: ABB CASE		Project Name / Location: 1400 SHAWNEE LND, FL		Project #:		No. of CONTAINERS		Parameter		Remarks																	
Item #	Date	Time	MATRIX	Sample Location				VOC - 601/2	PAH - 625	METALS - Pb	TRPH -	EDB -															
1	2/14/12	1730	1120	WHF - 2074 - 4				3	2	1	1	3															
2	2/14/12	1745	1120	WHF - 2074 - 5				3	2	1	1	3															
3	2/14/12	1800	1120	WHF - 2074 - 2D				3	2	1	1	3															
4	2/14/12	1815	1120	WHF - 2074 - 3				3	2	1	1	3															
5	2/14/12	1745	1120	WHF - 2074 - 6				3	2	1	1	3															
6	2/14/12	1815	1120	WHF - 2074 - 2				3	2	1	1	3															
7	2/14/12	1845	1120	WHF - 2074 - 1D				3	2	1	1	3															
8	2/14/12	1845	1120	WHF - 2074 - 1				3	2	1	1	3															
9	2/14/12	1845	1120	TOTI BLANK #1				3	2	1	1	3															
10	2/14/12	1845	1120	TOTI BLANK #2				3	2	1	1	3															
11	2/14/12	1845	1120	TOTI BLANK #3				3	2	1	1	3															
Report To: N. MAGANO				Transfer Number: 11				Item Number(s): 11				Relinquished By / Company: M. Magano				Accepted By / Company: [Signature]				Date: 2/14/12				Time: 6pm			
Additional Comments: PLEASE CONTACT N. MAGANO AT 904-650-8100				Total Containers: 11				Number of Coolers in Shipment: 5				Bailers: 0															

UST NON-CLP DATA REVIEW
FIELD INFORMATION
NEESA LEVEL E SAMPLING DATA

DATE: August 5, 1993

PROJECT: NAS Whiting Field

PROJECT No.: 7518.41

PROJECT MGR: John Kaiser

TO BE FILLED IN BY PROJECT PROFESSIONAL:

- | | | |
|--|---------------------------------|---------------------------------------|
| 1. Total number of samples: | monitoring wells (soil borings) | <u>9</u> |
| | duplicates (10%) | <u>1</u> |
| | trip blanks (1/cooler) | <u>1</u> |
| | equipment blank (1/day) | <u>1</u> |
| | field blank (1/event) | <u>1</u> |
| 2. Were any QA problems encountered during sampling?
If yes, explain below. | | <u>N</u> |
| 3. Were there any client-required deviations from standard field QA?
If yes, explain below. | | <u>N</u> |
| 4. What was the source of the sample bottles? | <u>Purge</u> | <u>LAB</u> |
| 5. What was the sampling period? | From: <u>07/13/93</u> | To: <u>07/14/93</u> ^{sample} |

TO BE FILLED IN BY THE REVIEWER:

- | | | |
|--|---------------------------------------|---------------|
| 1. Data set complete? | Y <input checked="" type="checkbox"/> | N <u>①</u> |
| 2. Were there any laboratory QA/QC problems noted in the report? | Y <input checked="" type="checkbox"/> | N <u> </u> |
| 3. Appropriate number of blanks collected? | Y <input checked="" type="checkbox"/> | N <u> </u> |
| 4. Appropriate number of duplicates collected? | Y <input checked="" type="checkbox"/> | N <u> </u> |
| 5. Complete chain of custody provided? | Y <input checked="" type="checkbox"/> | N <u> </u> |
| 6. Were the holding times for any sample exceeded? | Y <u> </u> | N <u> </u> |
| 7. Appropriate sample preservatives indicated on chain of custody? | Y <input checked="" type="checkbox"/> | N <u> </u> |

Explanations/Other: Lab QA/QC reports 2-Chloroethyl vinyl ether
concentrations were outside acceptable limits for accuracy
① LSC RESULTS WERE NOT INCLUDED IN REPORT

2894 DUP = WHF - 2894 - 2
MS/MSD = WHF - 2894 - 3

**UST NON-CLP DATA VALIDATION
KEROSENE AND MIXED PRODUCT ANALYTICAL GROUP**

PROJECT: NAS Whiting Field

LABORATORY: CH2M Hill

**VOLATILES ANALYSES (including EDB):
EPA Methods 601/602 or 5030/8010/8020**

Were surrogates within accepted limits?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Were laboratory and equipment blanks non-detects?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Were trip blanks non-detects?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Are the units of measure consistent?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Duplicates meet UST acceptance criteria (15-20%)?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Reported concentrations above detection limits?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Was an MS/MSD run? Was the recovery within limits?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Was an LCS run each day samples were analyzed?	Y <input type="checkbox"/> N <input type="checkbox"/>	ITEM: ①
Were LCS results within limits?	Y <input type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>

**POLYNUCLEAR AROMATIC HYDROCARBONS (PAH):
EPA Methods 610, 8100, 625, 3510/8240 or 3510/8270)**

Were surrogates within accepted limits?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Were laboratory and equipment blanks non-detects?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Are the units of measure consistent?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Reported concentrations above detection limits?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Duplicates meet UST acceptance criteria (15-20%)?	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>
Was an MS/MSD run? Was the recovery within limits?	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	ITEM: <input type="text"/>
Was an LCS run each day samples were analyzed?	Y <input type="checkbox"/> N <input type="checkbox"/>	ITEM: ①
Were LSC results within limits?	Y <input type="checkbox"/> N <input type="checkbox"/>	ITEM: <input type="text"/>

ITEMS: ① LSC RESULTS WERE NOT INCLUDED IN REPORT

UST NON-CLP DATA VALIDATION
KEROSENE AND MIXED PRODUCT ANALYTICAL GROUP

PROJECT: NAS Whiting Field

LABORATORY: CH2M Hill

INORGANICS ANALYSES - LEAD

EPA Method 239.2 or 7421

①

Were laboratory and equipment blanks non-detects?	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	ITEM: <input type="checkbox"/>
Duplicate samples meet UST acceptance criteria (20%)?	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	ITEM: <input type="checkbox"/>
Was an LCS run each day samples were analyzed?	Y <input type="checkbox"/>	N <input type="checkbox"/>	ITEM: ④
Were LSC recovery results within limits?	Y <input type="checkbox"/>	N <input type="checkbox"/>	ITEM: <input type="checkbox"/>
Reported concentrations ^{At or} above detection limits?	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	ITEM: <input type="checkbox"/>
Are the units of measure consistent?	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	ITEM: <input type="checkbox"/>

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS (TRPH):

EPA Method 418.1

Were laboratory and equipment blanks non-detects?	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	ITEM: ②
Are the units of measure consistent?	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	ITEM: <input type="checkbox"/>
Were reported concentrations ^{At or} above detection limits?	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	ITEM: <input type="checkbox"/>
Duplicates meet UST acceptance criteria (15-20%)?	Y <input type="checkbox"/>	N <input checked="" type="checkbox"/>	ITEM: ③
Was an MS/MSD run? Was the recovery within limits?	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	ITEM: <input type="checkbox"/>
Was an LSC run each day samples were analyzed?	Y <input type="checkbox"/>	N <input type="checkbox"/>	ITEM: ④
Were LSC recovery results within limits?	Y <input type="checkbox"/>	N <input type="checkbox"/>	ITEM: <input type="checkbox"/>

Items: ① High value detected in WHF-2894-01 may be due to high sediment quantities noted on C.O.C.

② The detection limit for the EP is higher than for the lab blank. It is unclear why the lab blank detection limit is lower than all others.

Recommendations: ③ Result shows up as non-detect but there are no units or detection limit. Not clear if the Pop for TRPH was actually run. PSW

④ LCS Results were not included in report.

Reviewer: [Signature]

Date: 8-5-93



QUALITY
ANALYTICAL
LABORATORIES

August 4, 1993

John Kaiser
ABB Environmental
2590 Executive Center Circle
Tallahassee, FL 32301

RE: Analytical Data for ABB/NAS Whiting Field
Lab Ref. No. 90068

Dear Mr. Kaiser:

On July 16, 1993 the CH2M HILL Gainesville Laboratory (LGN) received thirteen samples with a request for analysis of selected organic and inorganic parameters.

The analytical results and associated quality control data are enclosed. The samples for analyses of TPH were sent to the CH2M HILL Montgomery Laboratory (LMG).

Under CH2M HILL policy, your samples will be stored for up to 30 days after reporting. If you have not given us prior instructions for disposal, we will contact you if any samples require disposal as hazardous waste.

CH2M HILL Laboratories appreciate your business and look forward to serving your analytical needs again. If you should have any questions concerning the data, or if you need additional information, please call me or Tom Emenhiser, Client Services Manager, at 904-462-3050.

Sincerely,

A handwritten signature in cursive script, appearing to read "Karen Daniels".

Karen Daniels
Client Services Coordinator

Enclosures

State Certifications:

Florida No. 82112, E82124

Alabama No. 40080

California No. I-1014

TABLE OF CONTENTS

CH2M HILL Lab Ref. No. 90068

	Page <u>No.</u>
List of Organic Data Qualifiers	i
List of Sample ID Qualifiers	ii
Client Sample Cross-Reference	iii
Inorganic Data	
Cations	
Case Narrative(s)	1
Analytical Results	2
Blank(s) Results	4
TPH(Pereformed by LMG)	
Case Narrative(s)	5
Analytical Results	6
Blank(s) Results	20
Organic Data	
Purgeable Halocarbons/Aromatics	
Case Narrative	21
Analytical Results	24
Blank(s) Results	37
EDB	
Case Narrative(s)	40
Analytical Results	42
Blank(s) Results	54
Polynuclear Aromatic Hydrocarbons	
Case Narrative(s)	56
Analytical Results	59
Blank(s) Results	71
Copy of COC Documentation	73

ORGANIC DATA QUALIFIERS

- U Indicates the compound was analyzed for, but not detected. The number adjacent to the "U" qualifier indicates the reporting limit for that compound. The reporting limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.
- J Indicates an estimated value. It is used when the data indicates the presence of a compound below the stated reporting limit.
- C This flag applies to GC analytes only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- B This flag is used when the analyte is found in the associated blank, as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.
- E This qualifier indicates that the value reported exceeds the linear calibration range for that compound. Therefore, the sample should be reanalyzed at an appropriate dilution. The "E" qualified amount is an estimated concentration, and the results of the dilution will be reported on a separate Form I.
- D This qualifier indicates compounds which have been identified during a diluted reanalysis. "D" qualifiers are used for samples that have been analyzed initially at a lesser dilution than required for accurate quantification.

SAMPLE ID QUALIFIERS

The qualifiers that may be appended to the sample ID for organic analyses are defined below:

- DL or D -- Dilution Run. Indicates the sample contained compounds exceeding the calibration range. The sample was diluted and reanalyzed. Both results are reported.
- R -- Rerun. The sample was reanalyzed. The "R" is not used if the sample was also re-extracted.
- RE -- Re-extraction Analysis. The sample was re-extracted and reanalyzed.
- MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)
- MSD or MD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)

CLIENT SAMPLE CROSS-REFERENCE

CH2M HILL Lab Ref. No. 90068

CH2M HILL Lab Sample ID.	Client Lab Sample ID.
90068001	WHF2894EB
90068002	WHF2894FB
90068003	WHF28942D
90068004	WHF289405
90068005	WHF289407
90068006	WHF289403
90068007	WHF289404
90068008	WHF289401
90068009	WHF28941D
90068010	WHF289406
90068011	WHF289402
90068012	2894DUP00
90068013	TRAVEL BLANK

CASE NARRATIVE
Cations

Lab Number: GN-90068

Client/Project: ABB - NAS Whiting Field

I. Holding Time:
All holding times were met.

II. Digestion Exceptions:
None

III. Analysis:

A. Calibration:
All acceptance criteria were met.

B. Blanks:
All acceptance criteria were met.

C. ICP Interference Check Sample:
All acceptance criteria were met.

D. Spike Sample(s):
All acceptance criteria were met.

E. Duplicate Sample(s):
All acceptance criteria were met.

F. Laboratory Control Sample(s):
All acceptance criteria were met.

G. ICP Serial Dilution:
Not required for this level QC.

H. Other:
None.

IV. Documentation Exceptions:
None

V. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

SIGNED: Isaac P. Lynch DATE: 08/04/93
Isaac Lynch
Supervisor, Inorganics Division

000001



Engineers
Planners
Economists
Scientists

REPORT OF ANALYSIS

Florida Certification: 82112; E82124

AA1580
08/04/93
Page 1 of 3
Sample Nos: 9006801 - 9006812

ABB Environmental Services	CH2M HILL
Attention: John Kaiser Address: ABB	Project No: LGN35227.XY Received: 07/16/93 Reported: 08/04/93
Collected: 07/14/93 by client Type: water, grab Location: NAS Whiting Field Site 2894UST	

SAMPLE NUMBER	9006801	9006802	9006803	9006804	9006805
SAMPLE DESCRIPTIONS	WHF2894EB 07/14/93 08:20	WHF2894FB 07/14/93 08:35	WHF28942D 07/14/93 09:30	WHF289405 07/14/93 09:45	WHF289407 07/14/93 10:15
METALS					
Lead, Furnace	<0.002 08/03/93	<0.002 08/03/93	<0.002 08/03/93	<0.002 08/03/93	<0.002 08/03/93

NOTE: Values are mg/l as substance unless otherwise stated.

Respectfully submitted,

Isaac D. Lynch
Isaac D. Lynch, Inorganics Supervisor

n/r = not requested

NOTE: This report contains test data and no interpretation is intended or implied.



Engineers
Planners
Economists
Scientists

REPORT OF ANALYSIS

Florida Certification: 82112; E82124

AA1580

08/04/93

Page 2 of 3

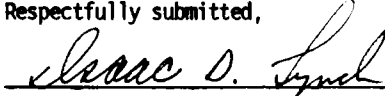
Sample Nos: 9006801- 9006812

ABB Environmental Services	CH2M HILL
Attention: John Kaiser Address: ABB	Project No: LGN35227.XY Received: 07/16/93 Reported: 08/04/93
Collected: 07/14/93 by client Type: water, grab Location: NAS Whiting Field Site 2894UST	

SAMPLE NUMBER	9006806	9006807	9006808	9006809	9006810
SAMPLE DESCRIPTIONS	WHF289403 07/14/93 10:40	WHF289404 07/14/93 14:00	WHF289401 07/14/93 14:15	WHF28941D 07/14/93 14:50	WHF289406 07/14/93 15:20
METALS					
Lead, Furnace	0.002 08/03/93	0.002 08/03/93	0.020 08/03/93	<0.002 07/30/93	<0.002 07/30/93

NOTE: Values are mg/l as substance unless otherwise stated.

Respectfully submitted,


Isaac D. Lynch, Inorganics Supervisor

n/r = not requested

NOTE: This report contains test data and no interpretation is intended or implied.



Engineers
Planners
Economists
Scientists

REPORT OF ANALYSIS

Florida Certification: 82112; E82124

AA1580

08/04/93

Page 3 of 3

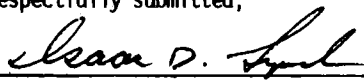
Sample Nos: 9006801 - 9006812

ABB Environmental Services	CH2M HILL
Attention: John Kaiser Address: ABB	Project No: LGN35227.XY Received: 07/16/93 Reported: 08/04/93
Collected: 07/14/93 by client Type: water, grab Location: NAS Whiting Field Site 2894UST	

SAMPLE NUMBER	9006811	9006812	
	WHF289402	2894DUP00	Laboratory
SAMPLE DESCRIPTIONS	07/14/93 15:45	07/14/93	Method Blank
METALS			
Lead, Furnace	<0.002 07/30/93	<0.002 07/30/93	<0.002 07/30/93

NOTE: Values are mg/l as substance unless otherwise stated.

Respectfully submitted,


Isaac D. Lynch, Inorganics Supervisor

n/r = not requested

NOTE: This report contains test data and no interpretation is intended or implied.

CASE NARRATIVE
General Chemistry

Lab Ref. No: 90068

Client/Project: ABB-WHITING FIELD

I. Holding Time:

All holding times were met.

II. Analysis:

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. Matrix Spike Sample(s):

All acceptance criteria were met.

D. Duplicate Sample(s):

All acceptance criteria were met.

E. Lab Control Sample(s):

All acceptance criteria were met.

F. Other:

None.

III. Documentation Exceptions:

None.

IV. I certify that this data package is in compliance with the terms and conditions agreed to by the client and CH2M HILL, both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

SIGNED: Joe Basile

Joe Basile

General Organic/Inorganic Supervisor

DATE: 8/3/93

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF2894EB 0820 GRAB

Laboratory Sample Number: 90068001 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: cht

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF2894FB 0835 GRAB

Laboratory Sample Number: 90068002 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF28942D 0930 GRAB

Laboratory Sample Number: 90068003 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.05	<0.05	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: VSH

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF289405 0945 GRAB

Laboratory Sample Number: 90068004 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF289407 1015 GRAB

Laboratory Sample Number: 90068005 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF289403 1040 GRAB

Laboratory Sample Number: 90068006 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: WHF

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93


Atten: MS. NANCY MOSURICK

Sample Description: WHF289404 1400 GRAB

Laboratory Sample Number: 90068007 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF289401 1415 GRAB

Laboratory Sample Number: 90068008 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF28941D 1450 GRAB

Laboratory Sample Number: 90068009 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF289406 1520 GRAB

Laboratory Sample Number: 90068010 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF289402 1545 GRAB

Laboratory Sample Number: 90068011 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: 2894DUP00 GRAB

Laboratory Sample Number: 90068012 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.06	<0.06	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF289403MS MATRIX SPIKE

Laboratory Sample Number: 90068M06 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	N/A	105.8	%rec	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: WHF289403MD DUPLICATE

Laboratory Sample Number: 90068P06 Date Collected: 07/14/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	N/A	ND	RPD	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

REPORT OF ANALYTICAL RESULTS

Date: 08/03/93

Client: CH2M HILL/LGN
ONE INNOVATION DRIVE, SUITE C
ALACHUA, FL 32615-9586

Project Number: LGN00999.99.WH
NAS WHITING FIELD SITE 2894 UST
Laboratory Number: 90068
Date Received: 07/17/93

Atten: MS. NANCY MOSURICK

Sample Description: METHOD BLANK

Laboratory Sample Number: 90068ZW1 Date Collected: 07/17/93 Matrix: WATER

Analytical Parameter	Method	Rep Limit	Result	Units	Ana Date
Total Petroleum Hydrocarbons	EPA418.1	0.05	<0.05	mg/L	08/02/93

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INRPRPT(v910124)

CASE NARRATIVE
GC VOLATILE SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: ABB Whiting UST
CASE NO. : N/A CONTRACT NO.: N/A
LAB NO. : GN-90068-A01-A13 SDG NO.: GN-90068

I. RECEIPT

A. DATE: JULY 16, 1993

B. SAMPLE INFORMATION

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>EXTRACTION</u> <u>DATE</u>	<u>ANALYSIS</u> <u>DATE</u>
90068A01R2	WHF2894EB	WATER	07/14/93	N/A	07/23/93
90068A02R1	WHF2894FB	WATER	07/14/93	N/A	07/22/93
90068A03R2	WHF28942D	WATER	07/14/93	N/A	07/23/93
90068A04R1	WHF289405	WATER	07/14/93	N/A	07/22/93
90068A05	WHF289407	WATER	07/14/93	N/A	07/22/93
90068A06	WHF289403	WATER	07/14/93	N/A	07/22/93
90068A07	WHF289404	WATER	07/14/93	N/A	07/22/93
90068A08	WHF289401	WATER	07/14/93	N/A	07/22/93
90068A09	WHF28941D	WATER	07/14/93	N/A	07/22/93
90068A10	WHF289406	WATER	07/14/93	N/A	07/22/93
90068A11	WHF289402	WATER	07/14/93	N/A	07/22/93
90068A12	2894DUP00	WATER	07/14/93	N/A	07/22/93
90068A13	TRAVEL BLA	WATER	07/14/93	N/A	07/21/93
2VBG21B	VLK001	WATER	N/A	N/A	07/21/93
2VBG22A	VLK002	WATER	N/A	N/A	07/22/93

C. Documentation

Exceptions: No exceptions were encountered.

000021

II. EXTRACTION

- A. Holding Times: Not applicable.
- B. Extraction
Exceptions: Not applicable.

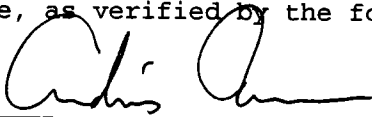
III. ANALYSIS

- A. Holding times: All holding times were met.
- B. Analytical
Exceptions: Samples WHF2894EB (90068A01) and WHF2894FB (90068A02) had one or more non-target aromatic halogenated compounds present.

IV. QUALITY CONTROL

- A. Method Blank: All blanks met acceptable QC criteria.
- B. Surrogate
Recoveries: All samples met acceptable QC criteria.
- C. Matrix Spike
Results: 2-Chloroethyl vinyl ether was outside acceptable limits for accuracy and/or precision. However, analysis of a continuing calibration standard immediately after the matrix spikes indicated that the analytical system was in control. Since MS/MSD results are subject to matrix effects, these values should be considered to be advisory.

- V. I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.



Andrés A. Romeu, Ph.D.
Manager, Organics Division

7/30/93

Date

000022

QC REFERENCES

The following is a list of the QC analyses to which the samples are referenced.

LAB SAMPLE ID	QC SAMPLE ID	
	MS/MSD	METHOD BLANK
90068A04R1 90068A13		2VBG21B
90068A01R2 90068A02R1 90068A03R2 90068A05 90068A06 90068A07 90068A08 90068A09 90068A10 90068A11 90068A12	90068A06	2VBG22A

WHF2894EB

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A01R2
Date analyzed:	7/23/93	Lab file 1 ID:	G22C019
Matrix:	WATER	Lab file 2 ID:	G22D019
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			100 % Rec.

WHF2894FB

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A02R1
Date analyzed:	7/22/93	Lab file 1 ID:	G22C010
Matrix:	WATER	Lab file 2 ID:	G22D010
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			97 % Rec.

000025

WHF28942D

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A03R2
Date analyzed:	7/23/93	Lab file 1 ID:	G22C018
Matrix:	WATER	Lab file 2 ID:	G22D018
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			100 % Rec.

WHF289405

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected: 7/14/93
Date extracted: N/A
Date analyzed: 7/22/93
Matrix: WATER
Method: 601/602M
% Moisture: 100

Sample Group: GN-90068
Lab Sample ID: GN-90068A04R1
Lab file 1 ID: G21C026
Lab file 2 ID: G21D026
Dilution Factor: 1.0000
Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			86 % Rec.

000027

WHF289407

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A05
Date analyzed:	7/22/93	Lab file 1 ID:	G22C012
Matrix:	WATER	Lab file 2 ID:	G22D012
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			101 % Rec.

000028

WHF289403

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A06
Date analyzed:	7/22/93	Lab file 1 ID:	G22C003
Matrix:	WATER	Lab file 2 ID:	G22D003
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			93 % Rec.

000029

WHF289404

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A07
Date analyzed:	7/22/93	Lab file 1 ID:	G22C004
Matrix:	WATER	Lab file 2 ID:	G22D004
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			95 % Rec.

000030

WHF289401

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A08
Date analyzed:	7/22/93	Lab file 1 ID:	G22C005
Matrix:	WATER	Lab file 2 ID:	G22D005
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			98 % Rec.

000031

WHP28941D

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A09
Date analyzed:	7/22/93	Lab file 1 ID:	G22C006
Matrix:	WATER	Lab file 2 ID:	G22D006
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			96 % Rec.

000032

WHF289406

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A10
Date analyzed:	7/22/93	Lab file 1 ID:	G22C007
Matrix:	WATER	Lab file 2 ID:	G22D007
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			100 % Rec.

000033

WHF289402

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A11
Date analyzed:	7/22/93	Lab file 1 ID:	G22C008
Matrix:	WATER	Lab file 2 ID:	G22D008
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			100 % Rec.

000034

2894DUP00

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A12
Date analyzed:	7/22/93	Lab file 1 ID:	G22C009
Matrix:	WATER	Lab file 2 ID:	G22D009
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			100 % Rec.

000035

TRAVEL BLA

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	GN-90068A13
Date analyzed:	7/21/93	Lab file 1 ID:	G21C012
Matrix:	WATER	Lab file 2 ID:	G21D012
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			108 % Rec.

000036

VBLK001

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	N/A	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	2VBG21B
Date analyzed:	7/21/93	Lab file 1 ID:	G21C003
Matrix:	Water	Lab file 2 ID:	G21D003
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			93 % Rec.

000037

VBLK002

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS/AROMATICS

Date collected:	N/A	Sample Group:	GN-90068
Date extracted:	N/A	Lab Sample ID:	2VBG22A
Date analyzed:	7/22/93	Lab file 1 ID:	G22C002
Matrix:	WATER	Lab file 2 ID:	G22D002
Method:	601/602M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
100-75-8	2-Chloroethyl vinyl ether	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
74-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethyl Benzene	1.0	U
1634-04-4	Methyl tert butyl ether	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61 to 133%)			97 % Rec.

000038

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY SUMMARY
PURGEABLE HALOCARBONS/AROMATICS

Matrix : WATER
Level : Low
Method : 601/602M

Lab Sample ID : GN-90068A06
Sample Group : GN-90068

Native Filename
G22C003
G22D003

MS Filename
G22C013
G22D013

MSD Filename
G22C014
G22D014

COMPOUND NAME	SPIKE ADDED (ug/L)	SAMPLE CONC. (ug/L)	MS CONC. (ug/L)	MS (%REC)	MSD CONC. (ug/L)	MSD (%REC)	RPD (%)	ADVISORY QC LIMITS		
								(%REC)	(RPD)	
Benzene	20	< 1.0	19	95	19	97	1.8	50	144	17
Bromodichloromethane	20	< 1.0	19	97	20	98	.3	59	145	22
Bromoform	20	< 1.0	18	88	18	91	3.8	50	124	35
Bromomethane	20	< 1.0	17	84	17	84	0.0	30	144	36
Carbon tetrachloride	20	< 1.0	16	82	17	85	3.7	61	143	24
Chlorobenzene	20	< 1.0	18	88	17	87	1.6	58	130	16
Chloroethane	20	< 1.0	15	77	17	84	8.5	54	157	25
Chloroform	20	< 1.0	18	90	19	94	4.1	52	133	24
Chloromethane	20	< 1.0	16	82	17	84	1.9	26	155	40
Dibromochloromethane	20	< 1.0	19	94	19	96	1.8	54	142	27
1,2-Dichlorobenzene	20	< 1.0	19	93	19	93	.6	58	137	19
1,3-Dichlorobenzene	20	< 1.0	18	91	17	86	5.9	57	131	26
1,4-Dichlorobenzene	20	< 1.0	20	100	19	95	5.3	42	139	25
Dichlorodifluoromethane	20	< 1.0	12	58	15	73	23	17	139	34
1,1-Dichloroethane	20	< 1.0	17	87	18	90	3.2	60	132	28
1,2-Dichloroethane	20	< 1.0	19	93	19	96	3.0	61	147	21
1,1-Dichloroethene	20	< 1.0	15	76	16	81	6.9	48	155	30
cis-1,2-Dichloroethene	20	< 1.0	17	87	18	89	2.2	57	148	22
trans-1,2-Dichloroethene	20	< 1.0	17	84	17	87	3.4	56	151	30
1,2-Dichloropropane	20	< 1.0	18	90	18	92	2.2	64	147	20
cis-1,3-Dichloropropene	20	< 1.0	17	84	17	84	0.0	63	135	23
trans-1,3-Dichloropropene	20	< 1.0	17	86	17	87	1.5	66	122	21
Ethyl Benzene	20	< 1.0	19	94	19	93	1.7	56	136	16
Methyl tert butyl ether	20	< 1.0	24	120	25	120	3.4	51	149	25
Methylene chloride (Dich	20	< 1.0	18	92	20	98	5.8	39	163	36
1,1,2,2-Tetrachloroethane	20	< 1.0	19	96	19	96	.2	68	141	29
Tetrachloroethene	20	< 1.0	17	83	16	82	.7	54	164	21
Toluene	20	< 1.0	19	94	19	95	1.7	53	138	18
1,1,1-Trichloroethane	20	< 1.0	17	85	17	87	2.7	57	160	30
1,1,2-Trichloroethane	20	< 1.0	19	94	19	96	2.2	59	136	25
Trichloroethene	20	< 1.0	17	84	16	82	2.8	60	149	23
Trichlorofluoromethane	20	< 1.0	16	79	17	84	5.3	46	161	25
Vinyl chloride	20	< 1.0	14	69	15	74	6.9	35	168	30
m- and p-Xylene	40	< 2.0	38	96	38	95	.9	59	136	17
o-Xylene	20	< 1.0	20	98	19	96	1.6	71	120	16

* = Value outside of Advisory QC Limits (see Case Narrative)

CASE NARRATIVE
GC VOLATILE SAMPLES

LABORATORY: CH2M HILL LABORATORIES

CLIENT: ABB Whiting UST

CASE NO. : N/A

CONTRACT NO.: N/A

LAB NO. : GN-90068-B01-B12

SDG NO.: GN-90068

I. RECEIPT

A. DATE: JULY 16, 1993

B. SAMPLE INFORMATION

<u>LAB SAMPLE ID</u>	<u>CLIENT SAMPLE ID</u>	<u>SAMPLE MATRIX</u>	<u>DATE SAMPLED</u>	<u>EXTRACTION DATE</u>	<u>ANALYSIS DATE</u>
90068B01	WHF2894EB	WATER	07/14/93	07/21/93	07/22/93
90068B02	WHF2894FB	WATER	07/14/93	07/21/93	07/22/93
90068B03	WHF28942D	WATER	07/14/93	07/21/93	07/22/93
90068B04	WHF289405	WATER	07/14/93	07/21/93	07/22/93
90068B05	WHF289407	WATER	07/14/93	07/21/93	07/22/93
90068B06	WHF289403	WATER	07/14/93	07/21/93	07/22/93
90068B07	WHF289404	WATER	07/14/93	07/21/93	07/23/93
90068B08	WHF289401	WATER	07/14/93	07/21/93	07/23/93
90068B09	WHF28941D	WATER	07/14/93	07/21/93	07/23/93
90068B10	WHF289406	WATER	07/14/93	07/21/93	07/23/93
90068B11	WHF289402	WATER	07/14/93	07/21/93	07/23/93
90068B12	2894DUP00	WATER	07/14/93	07/21/93	07/23/93
BKG21EDB	VBLK001	WATER	N/A	07/21/93	07/23/93

C. Documentation

Exceptions: No exceptions were encountered.

000040

II. EXTRACTION

- A. Holding Times: Not applicable.
- B. Extraction
Exceptions: Not applicable.

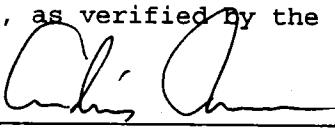
III. ANALYSIS

- A. Holding times: All holding times were met.
- B. Analytical
Exceptions: There were no analytical exceptions.

IV. QUALITY CONTROL

- A. Method Blank: All blanks met acceptable QC criteria.
- B. Surrogate
Recoveries: All samples met acceptable QC criteria.
- C. Matrix Spike
Results: All samples met acceptable QC criteria.

- V. I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.



Andrés A. Romeu, Ph.D.
Manager, Organics Division

7/30/93

Date

CLIENT SAMPLE ID

WHF2894EB

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B01
Date analyzed:	7/22/93	Lab file 1 ID:	G22E005
Matrix:	WATER	Lab file 2 ID:	G22F005
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			62 % Rec.

WHF2894FB

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B02
Date analyzed:	7/22/93	Lab file 1 ID:	G22E006
Matrix:	WATER	Lab file 2 ID:	G22F006
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			63 % Rec.

WHF28942D

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B03
Date analyzed:	7/22/93	Lab file 1 ID:	G22E007
Matrix:	WATER	Lab file 2 ID:	G22F007
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			64 % Rec.

000044

WHF289405

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B04
Date analyzed:	7/22/93	Lab file 1 ID:	G22E008
Matrix:	WATER	Lab file 2 ID:	G22F008
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			64 % Rec.

000045

WHF289407

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B05
Date analyzed:	7/22/93	Lab file 1 ID:	G22E009
Matrix:	WATER	Lab file 2 ID:	G22F009
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			66 % Rec.

WHF289403

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B06
Date analyzed:	7/22/93	Lab file 1 ID:	G22E010
Matrix:	WATER	Lab file 2 ID:	G22F010
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	0.06
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			65 % Rec.

000047

WHF289404

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068807
Date analyzed:	7/23/93	Lab file 1 ID:	G23E002
Matrix:	WATER	Lab file 2 ID:	G23F002
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			62 % Rec.

WHF289401

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B08
Date analyzed:	7/23/93	Lab file 1 ID:	G23E003
Matrix:	WATER	Lab file 2 ID:	G23F003
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			59 % Rec.

WHF28941D

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B09
Date analyzed:	7/23/93	Lab file 1 ID:	G23E004
Matrix:	WATER	Lab file 2 ID:	G23F004
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			59 % Rec.

WHF289406

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B10
Date analyzed:	7/23/93	Lab file 1 ID:	G23E005
Matrix:	WATER	Lab file 2 ID:	G23F005
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			62 % Rec.

WHF289402

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B11
Date analyzed:	7/23/93	Lab file 1 ID:	G23E006
Matrix:	WATER	Lab file 2 ID:	G23F006
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			61 % Rec.

2894DUP00

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	7/14/93	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	GN-90068B12
Date analyzed:	7/23/93	Lab file 1 ID:	G23E007
Matrix:	WATER	Lab file 2 ID:	G23F007
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			63 % Rec.

000053

VBLK001

REPORT OF ANALYTICAL RESULTS
EDB

Date collected:	N/A	Sample Group:	GN-90068
Date extracted:	7/21/93	Lab Sample ID:	BKG21EDB
Date analyzed:	7/23/93	Lab file 1 ID:	G23E017
Matrix:	Water	Lab file 2 ID:	G23F017
Method:	504M	Dilution Factor:	1.0000
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
106-93-4	1,2-Dibromoethane	0.02	U
SURROGATE-1,1,2-Trichloroethane (QC Limits - 46 to 105%)			67 % Rec.

000054

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY SUMMARY
EDB

Matrix : WATER
Level : Low
Method : 504M

Lab Sample ID : GN-90068B06
Sample Group : GN-90068

Native Filename
G22E010
G22F010

MS Filename
G22E011
G22F011

MSD Filename
G22E012
G22F012

COMPOUND NAME	SPIKE ADDED (ug/L)	SAMPLE CONC. (ug/L)	MS CONC. (ug/L)	MS (%REC)	MSD CONC. (ug/L)	MSD (%REC)	RPD (%)	ADVISORY QC LIMITS		
								(%REC)		(RPD)
1,2-Dibromoethane	0.17	0.06	0.16	60	0.19	78	29 *	56	148	21

* = Value outside of Advisory QC Limits (see Case Narrative)

CASE NARRATIVE
GC SEMI-VOLATILE SAMPLES

LABORATORY: CH2M HILL LABORATORIES CLIENT: ABB Whiting UST
CASE NO. : N/A CONTRACT NO.: N/A
LAB NO. : GN-90068-001-012 SDG NO.: GN-90068

I. RECEIPT

A. DATE: JULY 16, 1993

B. SAMPLE INFORMATION

<u>LAB SAMPLE ID</u>	<u>CLIENT SAMPLE ID</u>	<u>SAMPLE MATRIX</u>	<u>DATE SAMPLED</u>	<u>EXTRACTION DATE</u>	<u>ANALYSIS DATE</u>
90068001	WHF2894EB	WATER	07/14/93	07/17/93	07/23/93
90068002	WHF2894FB	WATER	07/14/93	07/17/93	07/23/93
90068003	WHF28942D	WATER	07/14/93	07/17/93	07/23/93
90068004	WHF289405	WATER	07/14/93	07/18/93	07/23/93
90068005	WHF289407	WATER	07/14/93	07/18/93	07/23/93
90068006	WHF289403	WATER	07/14/93	07/17/93	07/23/93
90068007	WHF289404	WATER	07/14/93	07/18/93	07/26/93
90068008	WHF289401	WATER	07/14/93	07/18/93	07/26/93
90068009	WHF28941D	WATER	07/14/93	07/18/93	07/26/93
90068010	WHF289406	WATER	07/14/93	07/18/93	07/26/93
90068011	WHF289402	WATER	07/14/93	07/18/93	07/26/93
90068012	2894DUP00	WATER	07/14/93	07/18/93	07/27/93
BKG17PNAA	SVBK001	WATER	N/A	07/17/93	07/22/93
BKG18PNAA	SVBK002	WATER	N/A	07/18/93	07/22/93

C. Documentation

Exceptions: No exceptions were encountered.

000056

II. EXTRACTION

- A. Holding Times: All holding times were met.
- B. Extraction
Exceptions: There were no extraction exceptions.

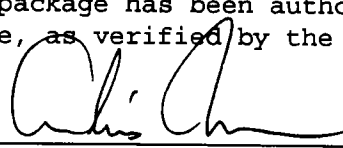
III. ANALYSIS

- A. Holding times: All holding times were met.
- B. Analytical
Exceptions: There were no analytical exceptions. None of the samples required clean-up to remove interferences.

IV. QUALITY CONTROL

- A. Method Blank: All blanks met acceptable QC criteria.
- B. Surrogate
Recoveries: All samples met acceptable QC criteria.
- C. Matrix Spike
Results: All samples met acceptable QC criteria.

- V. I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.



Andrés A. Romeu, Ph.D.
Manager, Organics Division

7/30/93

Date

QC REFERENCES

The following is a list of the QC analyses to which the samples are referenced.

LAB SAMPLE ID	QC SAMPLE ID METHOD BLANK
90068001	BKG17PNAA
90068002	
90068003	
90068006	
90068004	BKG18PNAA
90068005	
90068007	
90068008	
90068009	
90068010	
90068011	
90068012	

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/17/93

Lab Sample ID: 90068001

Date analyzed: 7/23/93

Lab file 1 ID: G22J013

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			84 % Rec.

WHF2894FB

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/17/93

Lab Sample ID: 90068002

Date analyzed: 7/23/93

Lab file 1 ID: G22J014

Matrix: WATER

Lab file 2 ID: N/A4

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			37 % Rec.

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/17/93

Lab Sample ID: 90068003

Date analyzed: 7/23/93

Lab file 1 ID: G22J019

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			68 % Rec.

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/18/93

Lab Sample ID: 90068004

Date analyzed: 7/23/93

Lab file 1 ID: G22J020

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			57 % Rec.

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/18/93

Lab Sample ID: 90068005

Date analyzed: 7/23/93

Lab file 1 ID: G22J021

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			79 % Rec.

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/17/93

Lab Sample ID: 90068006

Date analyzed: 7/23/93

Lab file 1 ID: G22J022

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			70 % Rec.

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/18/93

Lab Sample ID: 90068007

Date analyzed: 7/26/93

Lab file 1 ID: G26J007

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			55 % Rec.

WHF289401

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/18/93

Lab Sample ID: 90068008

Date analyzed: 7/26/93

Lab file 1 ID: G26J008

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			50 % Rec.

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/18/93

Lab Sample ID: 90068009

Date analyzed: 7/26/93

Lab file 1 ID: G26J009

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			62 % Rec.

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/18/93

Lab Sample ID: 90068010

Date analyzed: 7/26/93

Lab file 1 ID: G26J010

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			65 % Rec.

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/18/93

Lab Sample ID: 90068011

Date analyzed: 7/26/93

Lab file 1 ID: G26J011

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			66 % Rec.

2894DUP00

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: 7/14/93

Sample Group: GN-090068

Date extracted: 7/18/93

Lab Sample ID: 90068012

Date analyzed: 7/27/93

Lab file 1 ID: G26J012

Matrix: WATER

Lab file 2 ID: N/A

Method: 610

Dilution Factor: 1.0

% Moisture: 100

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			64 % Rec.

SVBK001

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: N/A

Date extracted: 7/17/93

Date analyzed: 7/22/93

Matrix: WATER

Method: 610

% Moisture: 100

Sample Group: GN-090068

Lab Sample ID: BKG17PNAA

Lab file 1 ID: G22J003

Lab file 2 ID: N/A

Dilution Factor: 1.0

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			75 % Rec.

REPORT OF ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS

Date collected: N/A

Date extracted: 7/18/93

Date analyzed: 7/22/93

Matrix: WATER

Method: 610

% Moisture: 100

Sample Group: GN-090068

Lab Sample ID: BKG18PNAA

Lab file 1 ID: G22J004

Lab file 2 ID: N/A

Dilution Factor: 1.0

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
83-32-9	Acenaphthene	2.0	U
208-96-8	Acenaphthylene	2.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
191-24-2	Benzo(ghi)perylene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
218-01-9	Chrysene	2.0	U
206-44-0	Fluoranthene	2.0	U
86-73-7	Fluorene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	2.0	U
129-00-0	Pyrene	2.0	U
SURROGATE D ₁₄ -p-Terphenyl (QC Limits - 24 to 100%)			69 % Rec.

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

[illegible]

CH2M HILL Project #

Project Name

Company Name/CH2M HILL Office

ABB-ES

Report Copy id:

John Kaiser

Dr. [] 904-942-7454-210

Requested Completion Date:

Requested Completion Date:	Sampling Requirements		Sample Disposal:
	SDWA	NPDES RCRA OTHER	Dispose: <input checked="" type="checkbox"/> Return <input type="checkbox"/>

(17.710)

**CLIENT SAMPLE ID
(9 CHARACTERS)**

1. *Phragmites australis* (Cav.) Trin. ex Steud.

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Date: 07/07/2014

Date	
Signature	

7	HL
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Data

	Date

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Her

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB, Pink - Client

Page 1 of 1

QC Level: 1

Date: 7-16-83

pH Checked By: Ken North

Check 10% of all samples: for HAZWRAP/NEESA samples check all samples!

Metals Aliquots (acid preserved):

7-16-93 1720
Date/Time:

Date/Time:

7-16-93 1715
Date/Time:

7/16/93 5:45 PM
Date/Time:

Date/Time: _____

Date/Time: _____

UST NON-CLP DATA REVIEW
FIELD INFORMATION
NEESA LEVEL E SAMPLING DATA

DATE: August 5, 1993

PROJECT: NAS Whiting Field

PROJECT No.: 7518.41

PROJECT MGR: John Kaiser

TO BE FILLED IN BY PROJECT PROFESSIONAL:

- | | | |
|--|---------------------------------|---------------------------------------|
| 1. Total number of samples: | monitoring wells (soil borings) | <u>9</u> |
| | duplicates (10%) | <u>1</u> |
| | trip blanks (1/cooler) | <u>1</u> |
| | equipment blank (1/day) | <u>1</u> |
| | field blank (1/event) | <u>1</u> |
| 2. Were any QA problems encountered during sampling?
If yes, explain below. | | <u>N</u> |
| 3. Were there any client-required deviations from standard field QA?
If yes, explain below. | | <u>N</u> |
| 4. What was the source of the sample bottles? | <u>Purge</u> | <u>LAB</u> |
| 5. What was the sampling period? | From: <u>07/13/93</u> | To: <u>07/14/93</u> ^{sample} |

TO BE FILLED IN BY THE REVIEWER:

- | | | |
|--|---------------------------------------|---------------|
| 1. Data set complete? | Y <input checked="" type="checkbox"/> | N <u>①</u> |
| 2. Were there any laboratory QA/QC problems noted in the report? | Y <input checked="" type="checkbox"/> | N <u> </u> |
| 3. Appropriate number of blanks collected? | Y <input checked="" type="checkbox"/> | N <u> </u> |
| 4. Appropriate number of duplicates collected? | Y <input checked="" type="checkbox"/> | N <u> </u> |
| 5. Complete chain of custody provided? | Y <input checked="" type="checkbox"/> | N <u> </u> |
| 6. Were the holding times for any sample exceeded? | Y <u> </u> | N <u> </u> |
| 7. Appropriate sample preservatives indicated on chain of custody? | Y <input checked="" type="checkbox"/> | N <u> </u> |

Explanations/Other: Lab QA/QC reports 2-Chloroethyl vinyl ether
concentrations were outside acceptable limits for accuracy
① LSC RESULTS WERE NOT INCLUDED IN REPORT

2894 DUP = WHF - 2894 - 2
MS/MSD = WHF - 2894 - 3

DOCUMENT TRACKING LOG

Project Name: <i>NAS Whiting Field</i>	Document Title: <i>Contamination Assessment Report</i> <i>Site 2894</i>
Task Order Manager: <i>John Kaiser</i>	Charge Number: <i>7518.50</i>

Schedule

Work Items	Responsibility	Scheduled Date/Time In	Actual Date/Time In	Work By*	Date/Time Out
KICK-OFF MEETING	John Kaiser	7-21-93			
WRITE DOCUMENT	Nikki Pagano				
Input text	Fredrika Brown				
Develop graphics	Keith Peterson				
Compile document	Nikki Pagano				
Release for review	NA				
TECHNICAL REVIEW					
Lead Technical Review	Jim Williams	9-24-93			
Supplemental Technical Review	Mike Dunaway Ken Busen	9-24-93 9-24-93			
Respond to review comments	Nikki Pagano	10-1-93			
Approve response to technical review comments	Jim Williams	10-1-93			
Revise draft	Nikki Pagano	10-1-93			
Input text/graphic corrections	Production	10-7-93			
EDITORIAL REVIEW					
Edit Document	S. Flagg	10-14-93			
Author review of revisions	Nikki Pagano	10-18-93			
Technical review of edits	Jim Williams	10-20-93			
Input text/graphic corrections	Production	10-22-93			
Compile Document	Sharon McDuffie	10-27-93			
OBTAIN SIGN-OFFS					
Task Order Manager Review	John Kaiser				
Lead Technical Review	Jim Williams				
Supplementary Tech. Review	Mike Dunaway Ken Busen				
Contracts/Purchasing Review	NA				
Editorial Review	S. Flagg				
Production Review	S. Calhoun				
Document Release Approval	PMO				
DISPATCH DOCUMENT	Sharon McDuffie	10-29-93			

Note: Initials in "Work By" indicate approval of document with changes indicated.

*** NOTIFY PRODUCTION MANAGER IMMEDIATELY WHEN DOCUMENT IS TRANSFERRED ***

Pink Form = Preliminary Draft; White Form = Draft; Yellow Form = Final Draft; Green Form = Final

Tech Review
Mtg 10-1-93
1:00pm

Mike

DOCUMENT TRACKING LOG

Project Name: <i>NAS Whiting Field</i>	Document Title: <i>Site 305 CARA</i>
Task Order Manager: <i>John Kaiser</i>	Charge Number: <i>7518.50</i>

Schedule

Work Items	Responsibility	Scheduled Date/Time In	Actual Date/Time In	Work By*	Date/Time Out
KICK-OFF MEETING	John Kaiser	9/10			
WRITE DOCUMENT	Nikki Pagano	complete			
Input text	Prod.	9/10 complete	9/10 2:00	ML	9/20 1:30
Develop graphics	Prod.	9/10 complete	9/10 2:00		
Compile document	Nikki Pagano	10-1-93 09:00	9/20 Text 1:30		
Release for review	John Kaiser	10-1-93			
TECHNICAL REVIEW		10-1-93			
Lead Technical Review	Jim Williams				
Supplemental Technical Review	Mike Dunaway Ken Busen	10-1-93 10-1-93			
Respond to review comments	Nikki Pagano	10-5-93			
Approve response to technical review comments	Jim Williams John Kaiser	10-5-93			
Revise draft	Nikki Pagano	10-5-93			
Input text/graphic corrections	Production	10-6-93			
EDITORIAL REVIEW					
Edit Document	S. Flagg	10-13-93			
Author review of revisions	Nikki Pagano	10-15-93			
Technical review of edits	Jim Williams	10-19-93			
Input text/graphic corrections	Production	10-21-93			
Compile Document	Sharon McDuffie	10-26-93			
OBTAIN SIGN-OFFS					
Task Order Manager Review	John Kaiser	10-29-93			
Lead Technical Review	Jim Williams				
Supplementary Tech. Review	Mike Dunaway Ken Busen				
Contracts/Purchasing Review	NA				
Editorial Review	S. Flagg				
Production Review	S. Calhoun				
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Tech Review
Mtg 10-5-93